COMMUNAL CONSUMPTION AT LATE NEOLITHIC SARNEVO:

FAUNAL EVIDENCE FROM A PIT SITE IN CENTRAL BULGARIA.

A Thesis

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Masters of Arts

by

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ABSTRACT

Rescue excavations carried out near the present day village of Sarnevo, Radnevsko district, Bulgaria have uncovered a large site with dozens of pit features, some larger and more elaborate than others. This site is one of a newly recognized type in Bulgaria and elsewhere in SE Europe, commonly referred to as a pit “sanctuary” or pit site. The features have yielded an astounding number of animal bones and explanations have been sought to explain the presence of both the pits and the large amounts of animal remains. Recent work (Karastoyanova 2011) on the largest and most elaborate of these features (Feature 9) has argued for a ritual interpretation,where the animal bones were rapidly deposited by communities perhaps participating in large scale feasts.

This thesis seeks to explore a greater number of pits from the western portion of the site, known as “Sector Central”, by investigating the breakdown of taxa, both wild and domestic, body part representation, age and sex-based cull patterns, and metrical analysis where appropriate. Feasting has been identified archaeologically by a number of material correlates, both faunal and non-faunal, and these are evaluated for the material at Sarnevo. It seeks to answer two fundamental questions about the faunal remains from these pits. First, is the feasting interpretation plausible for the remaining pits on the western side of the site (the majority of the Neolithic features)? Second, by examining the faunal remains on a pit by pit basis, and comparing them to the scant material recovered from outside the pits, can any patterns in the deposition of certain species or body parts be indentified? This is aimed at saying something about the nature of feasting at a Late Neolithic pit site.

Discussions of social organization in the late Neolithic usually stress either community cohesion or increasing differentiation through wealth accumulation and prestige building. Often the two are considered to be at odds with one another and create tensions which must be resolved. In many cases, commensal politics offer a means of establishing, negotiating and

maintaining social relationships both of cohesion and differentiation. Feasting is still poorly understood in this part of the world during the Neolithic.

The results from this work show that while alternative explanations still exist for the animal remains from Sarnevo, a feasting interpretation, based on both faunal and non-faunal correlates, is quite plausible. Though it is difficult from the available data to make any concrete conclusions on the nature of commensal politics during the Late Neolithic, the data from Sarnevo show that there was relatively equal access to all types of taxa, both wild and domestic, and to the same body portions from all size classes. This equitable distribution of meat might suggest that a more trans-egalitarian ethos was still very strong in Neolithic Thrace.

BIOGRAPHICAL SKETCH

John M. Gorczyk is a graduate of the University of Pittsburgh, where he received a B.A. in Anthropology, with a focus on archaeology, and History. During graduate study, he received a nine-month fellowship at the American Research Center in Sofia, Bulgaria, where he studied the history and prehistory of the region and conducted the faunal analysis from the Late Neolithic site of Sarnevo in Bulgarian Thrace. He has worked in contract archaeology in the eastern United States and has spent two field seasons in Bulgaria working a number of sites, ranging from the Early Neolithic to the Roman period.

To my parents, John and Carolyn

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I would like to thank Dr. Krum Bacvarov, NAIM-BAS, for allowing me to work on the faunal remains from his excavations at Sarnevo, and for providing me with information about the site. Special thanks go to Petar Zidarov, New Bulgarian University, who was integral at every stage of my research, from setting up the initial arrangement to work on the material to providing me full access to the resources at New Bulgarian University. He was also invaluable as a source of information and assistance during research. I am especially grateful to Nadia Karastoyanova, both for her pioneering thesis on the fauna from Feature 9 at Sarnevo and also for continuously lending her expertise to the analysis.

I would also like to thank the American Research Center, whose funding made the analysis possible, but also for providing a wonderful, fully rounded academic program that allowed me to understand my research in the wider context of both prehistoric and modern day Bulgaria. In this vein, I would like to extend special gratitude to the then director, Charles Graninger, and the director of the archaeology program, Dr. Emil Nankov, for their continued support.

Finally, I would like to thank Nerissa Russell for providing much needed direction and innumerable, invaluable comments during the write up of this thesis.

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Introduction

This thesis is the result of a nine month fellowship spent studying animal bones from a Late Neolithic (5400-500 BCE) site in south central Bulgaria called Sarnevo. In all, 10,348 bone fragments from thirty-one Late Neolithic features were examined. The bones were recorded over in the period from September 2011 to May 2012.

Sarnevo is one of many newly recognized site types not only in Bulgaria but across Southeastern Europe. Sometimes called pit sites or “pit sanctuaries”, they stand in contrast to the very well known and highly visible settlements, the most famous of which are the monumental tells. But they are also different from the “flat sites”, which are also settlements. Pit sites remain largely unpublished, and are being encountered more frequently (at least in Bulgaria) as rescue archaeology intensifies ahead of projects like the AM “Thrakia” highway that cuts across part of Bulgarian Thrace and was the reason Sarnevo was excavated in the first place. Unfortunately, this also means that they are being threatened at a higher rate.

Though variation exists among pits sites throughout the region, they share surprisingly many characteristics (outlined in the next section). Of greatest concern for this thesis is the high amount of heavily fragmented animal remains that are almost always in the deposits of these pits. Animal bone studies are not new to Bulgaria, but they have traditionally focused on remains from settlements, providing the potential for comparison with remains from non-settlement contexts. This thesis is a step toward a better understanding of the deposition of animal remains at a pit site. It is not the first of its kind: it builds on the work carried out by Nadia Karastoyanova in her 2011MA thesis for New Bulgarian University.

In addition to its comparative potential, a goal of this study is to contribute to our understanding of the relationship between practices of community cooperation and solidarity and the ever increasing potential for individual or group differentiation. As section 2 shows, unlike later prehistoric periods, where evidence for social differentiation is much clearer, how Late Neolithic communities managed these seemingly contradictory ideas is a lot less certain.

Section 2 also argues that animals, both wild and domestic, have an important place in the social lives of the inhabitants of Bulgarian Thace. The assumption, not always made in the Bulgarian literature, is that animals contribute far more to human society than calories. Both herding and hunting are likely to have been activities which involved community effort and participation. At the same time, animals (especially domestic) provided a means for accumulating ‘wealth’ and status in Neolithic society. Therefore, attitudes towards animals are likely to have been structured every bit as much by social, political, and symbolic concerns as dietary.

The consumption of animals is also something that is likely to have oftentimes occured at the community level. Section 3 discusses the importance of commensal politics in creating and reproducing relationship of both cooperation and competition. Feasting has become a popular topic in archaeology over the past few decades, with researchers realizing that many contexts and deposits represent the remains of communal consumption events. There are many different aspects to feasts, and identifying them in the archaeological record is never straightforward. Material correlates for feasting, including faunal correlates, are discussed and the potential for identifying them at Sarnevo is evaluated.

That the animal remains from Sarnevo were the result of communal activities seemed clear early on. The nature of their deposition—in large, elaborately constructed pits capped with burnt structural debris—seemed to make it obvious that these were special deposits. In her 2011 thesis, Karastoyanova argued for a ritual interpretation of the remains from the largest feature at the site, Feature 9. The feature itself was very complex and contained nearly 2800 animal bone fragments. What was needed next was an expansion of her faunal analysis to the surrounding features in order to refine or reject the feasting hypothesis.

There is no feasting profile for animal remains. Just as feasts defy rigid classificatory systems (Dietler 2001; Hamilakis 2008), animal remains on archaeological sites are the result of an assortment of processes, both cultural and biological, which condition the state in which they are recovered by archaeologists. Therefore, section 4 provides a detailed analysis of the recovery methods and taphonomy at the site, in addition to laying out the procedures used during analysis. Section 5 is intended to serve as the primary faunal report for Late Neolithic features at Sarnevo. Although not all features were examined, due to time and manpower constraints, the majority of the pits from the western portion of the site (Sector Central) are included. It is my hope that this section could stand on its own as a faunal report if need be. Section 6 looks at the distribution of animal remains throughout the features in Sector Central in order to identify any patterns of deposition of animal remains at the site. This is intended to shed light on a.) the function of the three different pit types at the site b.) any potential spatial grouping of the pits, and c.) the characteristics of feasting during the Late Neolithic. I do not mean to place the activities at Sarnevo into any feasting typologies, but rather to understand some of the major characteristics of feasting at the site. For example, can the features be attributed to individual household, kin, or corporate groups, whose pattern of consumption and deposition of animal remains stands in stark contrast to others? Are certain types of animals considered special feasting foods, while others might seem the subject of partial or total taboos? Is there limited access to certain taxa or body parts among different participants? The answers to these questions may lend insight into the socio-political nature of commensal relations during the Late Neolithic.Other aims of this project include starting a larger discussion about human-animal relationships throughout the Neolithic in Bulgaria and raising awareness about the importance of a unique type of site that is rapidly being uncovered (and destroyed) by the forces of modern expansion. I hope that this thesis, coupled with Karastoyanova's work, will provide a template for future faunal studies on pit sites but also a good comparative baseline for investigations in settlements. It will become clear throughout this thesis that there is potential for more work to be done, both on the unexamined bones still sitting in the laboratory at New Bulgarian University and from the database of faunal remains I created over the last year. This database, in a widely available Microsoft Access format, is extensive: in fact I collected more information than I ended up using in this thesis. In making this database widely available to other archaeologists, I hope the information can be reused for future research, both at Sarnevo and other sites.

The site of Sarnevo, now completely under the AM Thrakia Highway (under construction).

1. Late Neolithic Sarnevo

The faunal remains for this study were recovered over three field seasons at the site of Sarnevo in the Stara Zagora District[1], Republic of Bulgaria. Their recovery was the result of back to back rescue excavations ahead of the construction of the AM "Trakia" highway, headed in the first season, 2008, by Milena Tonkova of the National Archaeological Institute and Museum-Bulgarian Academy of Sciences (NAIM-BAS) and in 2009 and 2010 the excavations were given over to Dr. Krum Bacvarov, also of NAIM-BAS, who serves as the principle investigator and publisher. The site awaits final publication in the coming year, and this faunal report (and the report on the Roman period fauna) will be included in the publication.

1.1 Location and geophysical description of the site

Sarnevo is located in the Stara Zagora district of Bulgaria in the North-central part of the Thracian plain approximately 13 km south of the Sredna Gora, the foothills that border the Stara Planina (Balkan Mountains; Figure 1.1). The site is located on the right side of the river Azmak, on a primary terrace of the river roughly 2 km NW of the present day village of Pshenichevo (Bacvarov, et al 2009: 47). Though it is closer to this village it takes its name from the larger village of Sarnevo just to the SW along Route 57 (Figure 1.2).

[1] The site is technically in the Radnevo District, although it is very near the border with the Stara Zagora. Both districts are used when describing the site in the Bulgarian literature. Here I use Stara Zagora because it is a more recognizable district.

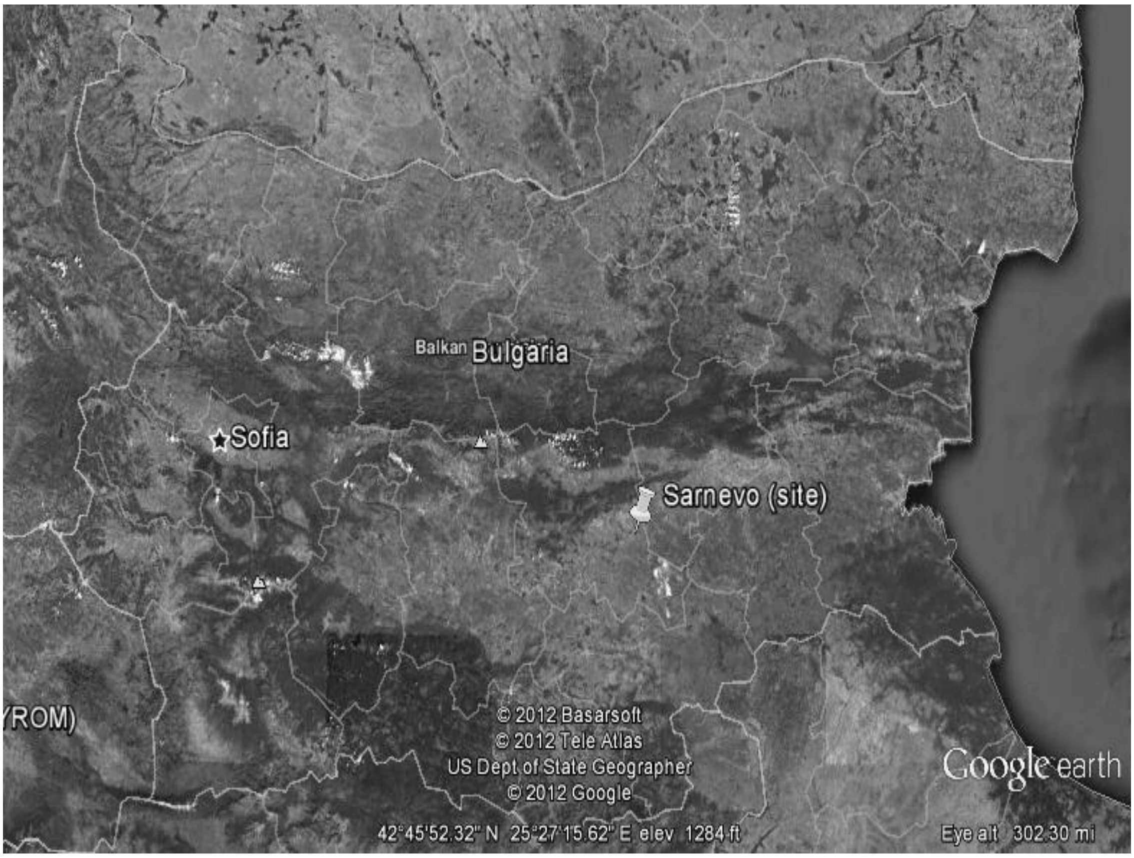

Figure 1. 1. Site location

Sarnevo is not a habitation site, but it is located in a network of sites in the vicinity. Tell Kaleto is the closest, approximately 800 m to the north (Karastoyanova 2011: 10), and two others are located within 4 km. Most likely the burnt debris that is so important to interpretations of Sarnevo comes from the structures of one or more of these sites, although at this time it is impossible to determine which: Tell Kaleto, like many Bulgarian tells, has not been excavated, although surface collection has shown that it is contemporaneous with Sarnvo.

As with other parts of Bulgarian Thrace, the two predominant soil types are smolnitzas and cinnamonic forest soils (chernozems: Dennell 1978:61-62; Gaydarska 2007: 48). The high clay content of smolnitzas can be seen at Sarnevo, where clay was abundant and used to coat many of the pits. The typically high Ca content of smolnitzas (which grade quickly into a Ca horizon, Dennell 1978: 62) resulted in much of the faunal material being covered in a calcareous concretion (Karastoyanova 2011: 10: see below and section 4).

Figure 1. 2. Sarnevo's position on the banks of the Azmak River

1.2 The prehistoric environment

Figure 1.2 shows that the vicinity of the site is characteristic of this part of Bulgarian Thrace: extensive tracts of land cleared for agriculture. Reconstructing the paleoenvironment is not straightforward. During the 1970s the first attempts were made, combining geomorphology with palynological evidence to produce a general picture of the ancient landscape (e.g. Dennell and Webley 1975, Dennell 1978). It should be made clear, however, that reconstructing ancient environments must be done on a micro-regional scale. Gaydarska's 2007 study of the landscape and prehistoric environment of three river valleys just to the east of Radnevo is a good example. Her results showed that the area was indeed more heavily forested and that large-scale forest clearing did not take place during the preshitoric period, as has been argued elsewhere (Popova 2010): "sustained, successful agro-pastoral strategies continued from the Neolithic to the modern farming of the 20th century" (Gaydarska 2007: 69). A similar situation was reported for the Struma River valley to the west by Marinova et al (2012), who also found that the human impact on the natural environment was minimal during most of the Neolithic.

Sarnevo is located in the same climate region as Gaydarska's study and as part of Bulgarian Thrace exhibits roughly similar soil and climate characteristics. The presence at Sarnevo of large numbers of wild animals means that game must have been more locally available than it is today. The large proportions of fallow deer at the site would seem to arge for some sort of middle griund between heavily forested environs and large tracts of cleared land. The environment was most likely mixed forest and cleared space.

1.3 Site features

The excavated area of the site is approximately 11 decares, and is characterized by a large quantity of pit features, mostly dating to the Late Neolithic but also to the Early and Late Iron Ages and the Roman Period (Bacvarov, et al 2009: 47). The Late Neolithic pits are most heavily concentrated on the western part of the site, which has been designated by the PI as "Sector Central". A few Late Neolithic pits are present in the eastern part of the site, but the majority belongs to other periods (Karastoyanova 2011: 10). In some cases the later pits are intrusive into the Neolithic ones. This was true of only one Neolithic feature in Sector Central (Feature 1), which was partially destroyed by a pit from the Late Iron Age. The pit was excluded from study.

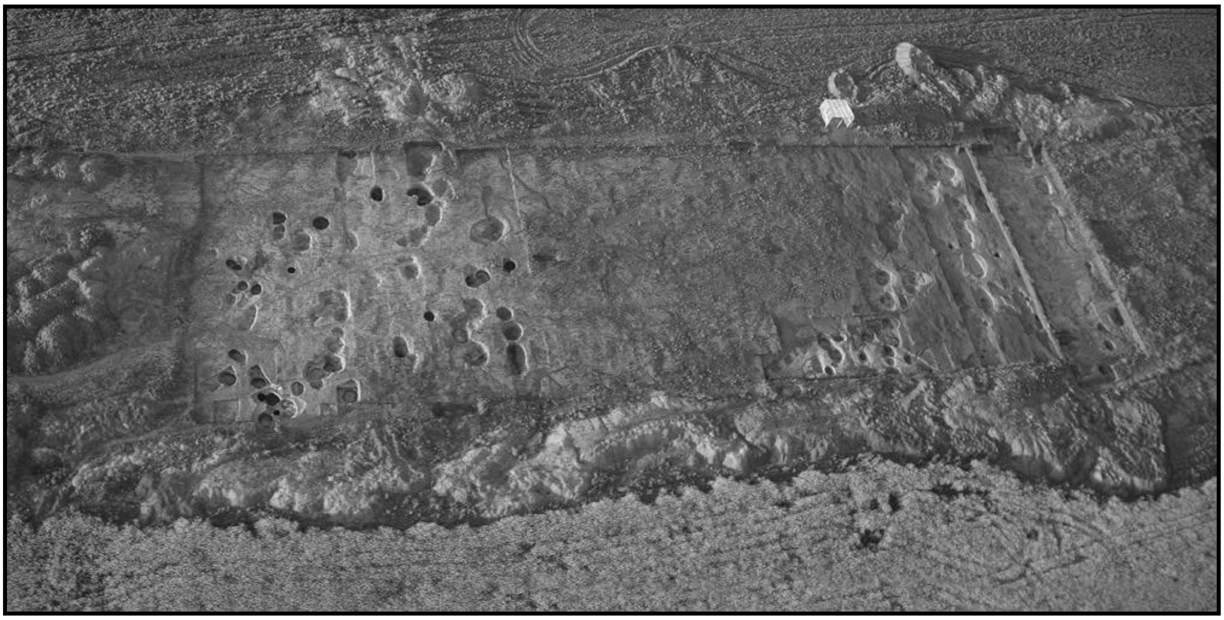

Figure 1. 3. Aerial view of Sarnevo features after excavation in the 2009 season. Facing south. Sector Central is on the right hand side.

The largest pits show a loose spatial correlation where they are aligned in two roughly parallel rows running north to south, with a large interior space (5-7m) where there are a few small features and comparatively few animal remains (Fig 1.5). Some Neolithic features, like Feature 89, are outliers to this complex and were not included in the faunal analysis.

Each pit, regardless of size or type, yielded broken (and sometimes complete) ceramic vessels and animal bones, and each pit was "capped" with the remains from destroyed structures, presumably brought from elsewhere, since as of yet no domestic architecture has been identified at the site. Some were lined with sterile clay on the sides and bottoms. Though some features (such as features 34 or 9) contained multiple inner pits, these

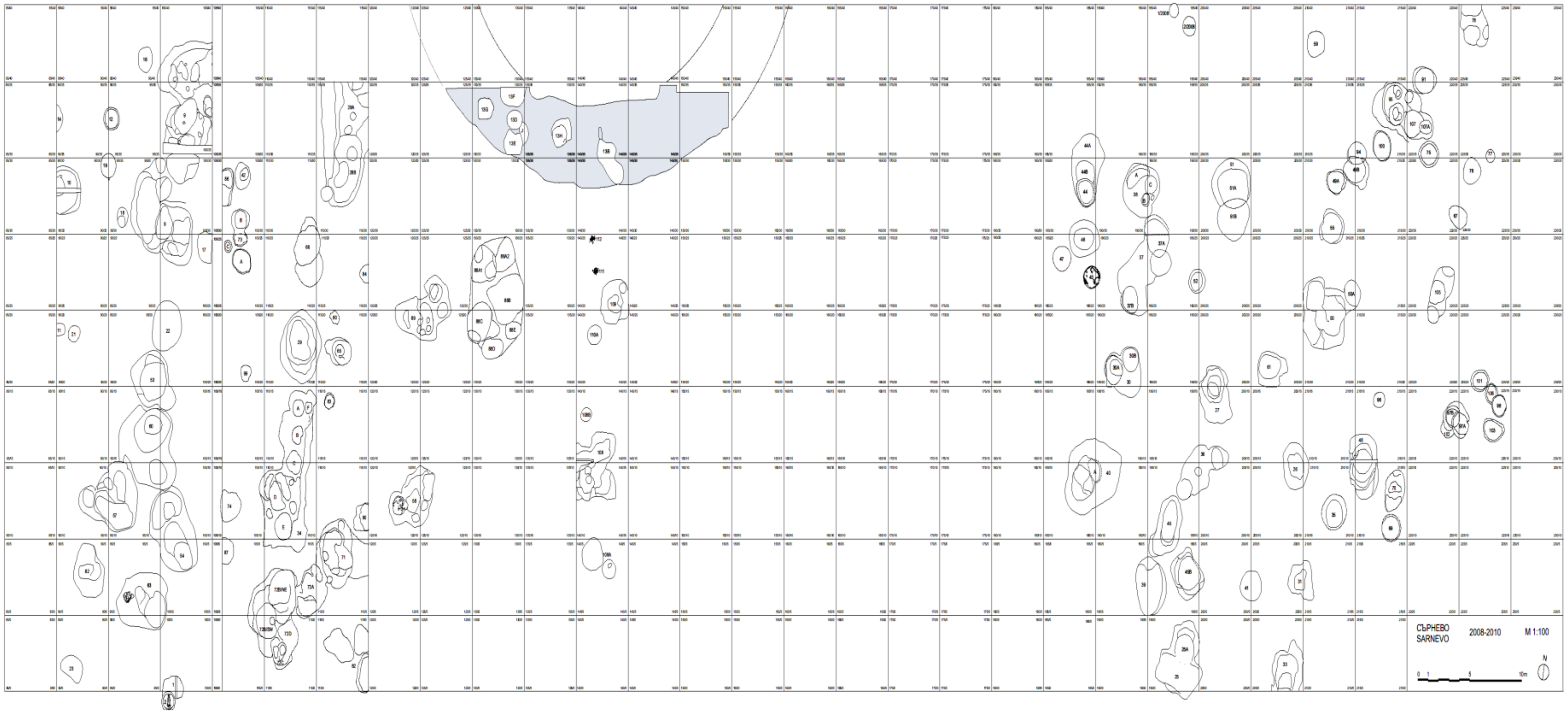

Figure 1.4: Sarnevo site map. Sector Central is on the left.

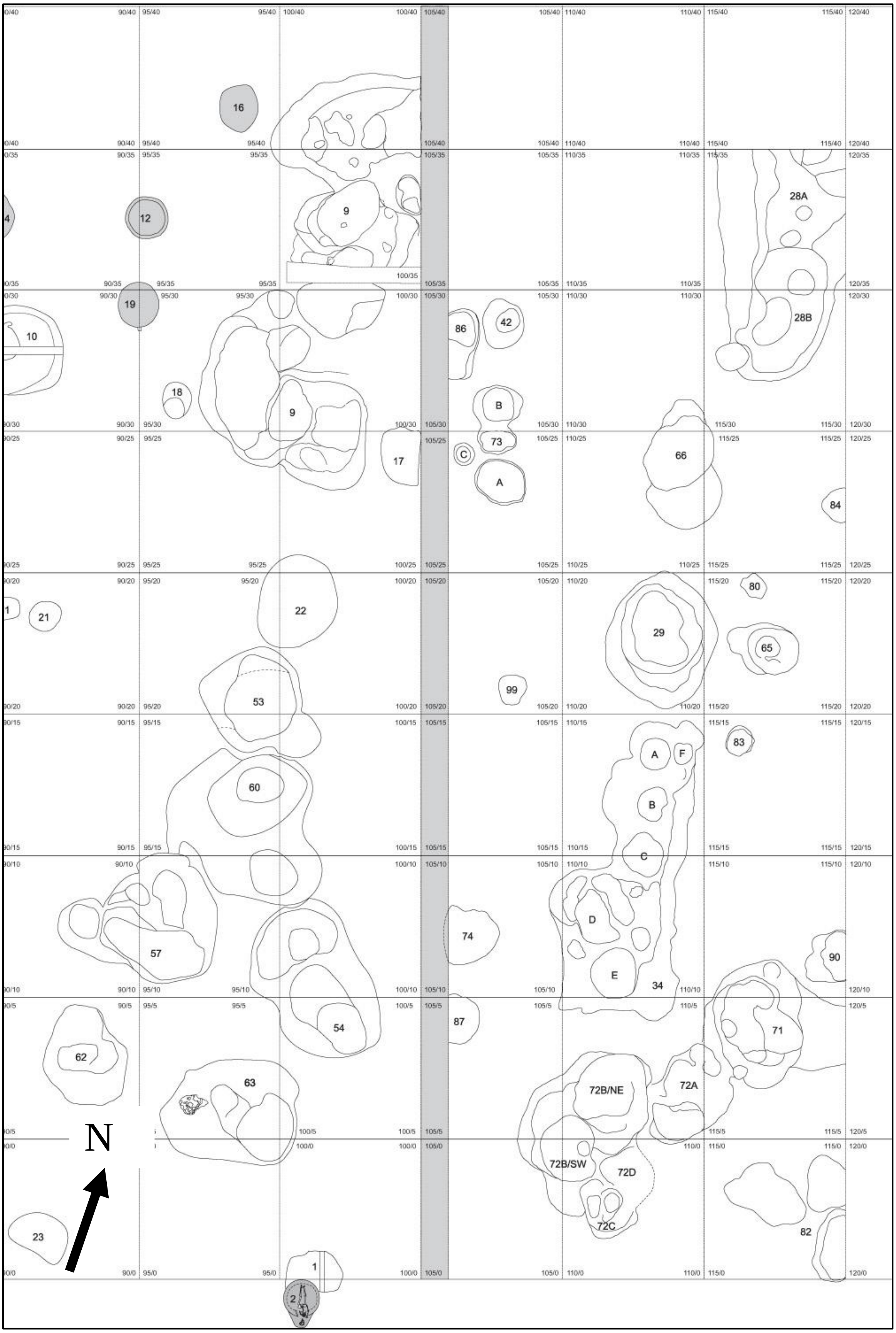

Figure 1. 5 Features in Sector Central at Sarnevo. Grid is 5x5m

deposits were recorded by the PI as single deposition events; their vertical stratigraphy is homogenous and they do not represent different episodes of filling. The pits at Sarnevo and the presence/importance of pits on Neolithic sites will be examined in greater detail in section 6.

1.4 Relative and absolute dating

The deposits from the Late Neolithic were initially identified based on ceramic typology, a system of relative dating that has been well established in Bulgaria and especially Bulgarian Thrace since the second half of the 20th century (see section 2). The ceramics are characteristic of the period Karanovo III-IV, or the second phase of the Late Neolithic in Thrace (Bacvarov et al 2009, 2010).

Twenty-four radiocarbon dates were taken from animal bones recovered from the site, from 8 different features (Table 1.1). Karastoyanova published the six that came from Feature 9, and the remainder await publication in the site volume. They give a rough range of 5400-5200 cal. BC, which fits well with the relative chronology.

Table 1. 1. : Radiocarbon dates from Late Neolithic features at Sarnevo

Sample ID	Feature	d13C	Age error 1 sigma	2-sigma range BC		median probability	Age BP
				upper	lower		
7	73A	-19.9	30	5469	5326	5404	6410
18	40 south	-19.9	30	5469	5323	5398	6405
13	9	-18.7	30	5469	5321	5388	6400
17	40 south	-20.4	30	5469	5321	5388	6400
6	73A	-20.3	30	5468	5312	5366	6385
11	9A	-20.1	30	5468	5312	5366	6385
14	13H	-20.0	30	5467	5306	5356	6375
10	9 south	-18.3	30	5467	5303	5351	6370
23	58	-18.7	30	5467	5303	5351	6370
25	58	-20.2	30	5467	5303	5351	6370
15	13H	-19.6	30	5467	5231	5343	6360
5	73A	-20.3	30	-5466	5228	5338	6355
12	9 east	-19.9	30	5466	5228	5338	6355

21	48	-19.0	30	5465	5225	5334	6350
22	48	-19.0	30	5465	5225	5334	6350
28	88	-20.0	30	5465	5225	5334	6350
9	9	-19.7	30	5373	5222	5317	6335
8	9	-18.2	30	5359	5222	5301	6320
20	48	-19.3	30	5359	5222	5301	6320
26	88	-18.1	30	5351	5218	5284	6310
29	66	-16.7	30	5351	5218	5284	6310
27	88	-17.1	30	5315	5215	5264	6280

Only two of the pits examined in this study yielded radiocarbon dates. Feature 73A, with median dates from between 5404 and 5338 cal. BC, and Feature 66, with a median probability of 5284 cal. BC: oddly enough, the oldest and one of the youngest pits. Unfortunately radiocarbon dates became available only after analysis of the faunal remains was complete; it would have been interesting to arrange the pits in chronological order and examine the faunal remains accordingly.

This gives the site a minimum use life of roughly 200 years, though it may well have been longer. In the larger, more complex features, like Feature 9, the several inner pits (section 6) yielded different radiocarbon dates spanning 87 years. Though the individual deposits seem to have been filled in rather rapidly, it appears that the feature as a whole was a locus for recurring deposition across a few generations.

1.5 Site interpretations: the pit "sanctuary"

Sarnevo is a fascinating site, in that it is comprised mostly of dug out features with no evidence for domestic architecture anywhere in the studied area. It is not considered a settlement. However it is clear that it was a focal point for intense, recurring activities which left considerable material remains, including animal bones. It is characteristic of a type of site long neglected in Bulgarian prehistory, the so-called "pit sanctuary".

While it may be interesting, Sarnevo is not unique. Similar sites have won relatively recent recognition throughout the Balkans. In Bulgaria, it is only within the last 5-7 years that they have begun to receive the appropriate attention. This is probably due in part to the long-standing focus on tell settlement archaeology. The high visibility of tells in the landscape makes them alluring sites for archaeological study. Both Whittle (1985) and Bailey (2000) recognized this problem, although they were referring specifically to the lack of information regarding "flat" habitation sites.

Another contributing factor must be the rising influence of rescue archaeology/cultural resource management in identifying and excavating archaeological sites. As the number of internal improvement projects such as highways increases in Bulgaria, sites away from tells are being encountered in ever increasing numbers. This is a trend that is likely to continue, as funding for academic programs continues to dry up and the Bulgarian government continues pushing large-scale construction activities.

Since our understanding of "pit sanctuaries" (or pit sites, as I shall refer to them) is in its earliest stages, there is still not a general consensus among local scholars as to their primary function. It remains possible that more ephemeral types of architecture have been missed, cleared away along with the plowzone or in nearby, unexcavated portions of the site. While more excavation and more studies will certainly contribute to our understanding of pit sites, one thing seems clear. Whatever the true purpose(s) of sites like Sarnevo, they are part of a mosaic pattern of settlement spanning the Neolithic and Chalcolithic in SE Europe; part of a fluid landscape (Bailey 2007) involving mobility, sedentism, and networking between communities both within and beyond Bulgarian Thrace.

Given how recently we have become aware of them, pit sites are not yet published. The only information available to the public comes from the annual archaeological reports which are mandatory for all excavators to submit. This volume, *Archaeological Excavations and Discoveries* (*Arhaeologicheski Raskopki i Otkritiya),* contains only the most basic information about excavations on a year to year basis. Usually the submissions provide only a few paragraphs and at best 2-3 pages of some general information with some color photographs and graphics. Karastoyanova's 2011 master's thesis is to date the only detailed look at the fauna from such sites.

There is, however, enough information about pit sites to begin talking about some general characteristics. Nikolov (2011) presented a summary of all pit sites known to exist in Bulgaria at that point. Upon reading his summary, some common features of the pit site emerge:

- Conspicuous lack of domestic architecture (although artifacts related to 'domestic' activities, such as cereal processing, are usually present).
- Concentrations of pits, some extremely large, that are spatially very close to one another.
- "Special" treatment of the pits. This may include lining with sterile clay, patterns of deposition of artifacts within the pits, and/or "capping" the deposits with the burned remains of structure walls.

Nikolov also recommended a reevaluation of previously published sites, claiming the evidence better supported a pit sanctuary interpretation rather than a settlement. Some of these, such as Hadjidimitrovo, are still hotly debated. The lack of domestic architecture, the high amounts of animal bones and broken ceramics, and the special treatment of the pits themselves are enough to convince many scholars, like Nikolov, that a strictly ritual interpretation of such sites is appropriate. This mythicized, ritual nature of these non-settlements is the origin of the term "pit-sanctuary"; however some scholars are more wary of the ritual label, and prefer to view such sites as settlements comprised of pit houses (*zemlyanki)*.

Table 1. 2. List of pit sites in Bulgaria, taken from Nikolov (2011)

Name	Location	Publication
New sites: 2006-2010		
Dana Bunar 2	Lyubimets	Nikolov 2007, 2009
Halka Bunar	Chirpan municipality	M. Tonkova (year?)
Sarnevo	Stara Zagora district	Bacvarov 2010
Sabrano	Nova Zagora district	Bozhkova 2010
Ezero	Nova Zagora district	Sotirov 2010
Bikovo	Nova Zagora district	Velkov 2010
Chokoba	Sliven district	K. Leshtakov 2009, M. Leshatakov 2010
Hadzhidimitrovo	Yambol district	Petrova 2010
Devetek	Karnobat district	Agre 2010
Chernomoretz	Burgas District	Leshatakov, Klasnakov 2010
Budzhaka	Sozopol	Leshatakov, Samichkova 2010
Old sites “reinterpreted”		
Ohoden	Vratsa district	Ganetzovski 2009 (monograph)
Krum	Dimitrovgrad	Vandova 2010 (excavations)
Kalugerovo	Pazardjik	Gizdova, Kanchev 2000 (14-89)
Golyamo Delchevo	Varna district	Todorova 1982
Simeonovgrad		Raduncheva 2002, 2003;Boyadzhiev 2008
Usoe	Asparuhovo, Dalgopol district	Todorova 1973, 1973a
Durankulak-Nivata	Dobrich district	Dimov 1982
Podgoritsa	Targovishte district	Angelova 2005

The information presented in Table 1.2 shows that the pit site has a wide spatial distribution in Bulgaria. They also show a temporal distribution that spans the entire Neolithic.

If pit sites are in fact the foci for ritual activities, it is perhaps not surprising that there is no evidence of houses. Ritual activities often take place away from settlements, for both practical and symbolic reasons. There is, of course, the very real problem of disposing of thousands of animal bones left over from feasts, but ethnographic evidence shows that in many cases there is also a very real concern with keeping ritual activities strictly separate from daily ones, in an effort to dissipate their power (Russell 2012a: 390). The question of whether the animal carcasses at Sarnevo were consumed on site or carried from a nearby settlement for deposition is still very much in the air.

Attempting to identify ritual in the archaeological record can be tricky, especially in prehistory. My main concern with the faunal remains at Sarnevo is to determine whether their presence and deposition are a result of ritualized activity—specifically feasting—as has been argued by both the site excavator Dr. Krum Bacvarov and by Nadia Karastoyanova, whose study of the remains of the largest feature (Feature 9) led her to the same conclusion. There are a number of archaeological and zooarchaeological correlates of feasting that will be discussed in section 3, although it will be clear by the end of this thesis that they are hardly straightforward indicators.

This thesis is not intended to be the final verdict on the function(s) of Sarnevo and sites like it. Claiming that Sarnevo is only a feasting site probably misses the more complex picture of settlement patterns in Bulgarian Thrace during the Neolithic. It is useful to imagine that pit sites like Sarnevo are but one component in a network of sites that is almost certainly more fluid than previously believed (c.f. Bailey 2007). Section 2 will discuss in more detail settlement patterns and patterns of mobility/sedentism during the Bulgarian Neolithic. Part of understanding the relationship of these sites to one another is determining what activities took place at each site, and how these differ from other sites. Attitudes towards consumption and deposition of animal remains are a critical part of this relationship, and this thesis provides a stepping stone for comparison of fauna from a pit site with fauna from flat sites, tells, caves, etc.

1.6 Notes about context

For the analysis of the mammal bones from Sarnevo, I divided the western portion of the site, Sector Central, into two contexts: pit and non-pit. ‘Pits’ is relatively self-explanatory: it refers to all dug-out features that produced animal remains, regardless of pit size or number of specimens. This rather coarse contextual grouping was necessary, as the pits await more formal analysis (Bacvarov, in press). As discussed in section 6, the possibility exists that there are several different types of pits and that these may be related to different activities. The good thing about the manner in which the faunal data was recorded for this study is that the data can be re-aggregated to accommodate any grouping of the pits during future research.

Non-pit simply refers to the 5x5 meter squares in which the features were located. Cultural materials were only collected in the field from Layer 2, the Late Neolithic surface into which the features were dug. The overlying sediment was stripped off by mechanical excavator and carried away as plowzone. Specifically, I looked at all quadrants from 100/35 to 110/35 in the north and 100/0 to 115/0 in the south, and every square in between. The general idea, given time constraints, was to investigate differences in the deposition of faunal material between the pit features and the relatively "clean" area between them, to look for meaningful patterning of faunal remains in pits and non-pits. The specific methodologies related to faunal analysis will be elaborated upon in sections 4 and 5.

2: The Late Neolithic in Bulgaria

Neolithic research has a long and varied history in Bulgaria and Europe more broadly. Since it is the period in which the first food-producing communities appear on the European continent, from a very early date Western scholars showed a keen interest in understanding the economic, social, and symbolic lives of these early farmers. This thesis cannot provide a thorough overview of the entire history of the Neolithic in SE Europe (see Tringham 1971, Whittle 1985, 1996 and Bailey 2000 for general overviews, and Orton 2008 and 2009 for a good discussion of the evolution of Neolithic concepts). Rather, I discuss some of the specific trends in Neolithic and prehistoric research in Bulgaria throughout the 20th century in order to situate this thesis in relation to both past interpretive frameworks and current trends in Bulgarian archaeology in the early 21st century. For a more detailed review of 20th century Bulgarian prehistoric research and interpretive frameworks, see Gaydarska 2007.

2.1 History of Research

The Neolithic period has been a favorite topic of Bulgarian scholars since the establishment of formal archaeological practice in Bulgaria. Up until the Second World War energies were focused mainly on recording prehistoric sites and building museum collections, with limited attempts at stratigraphic excavation (Todorova 1995: 79). This naturally produced large amounts of material culture with uncertain context and dubious chronologies. One unfortunate result of this was the equation of Neolithic ceramic forms in Bulgaria with the Bronze Age settlement of Troy in modern day Turkey, producing a short chronology not only for Bulgarian but also European prehistory (Gaydarska 2007: 7).

The largest pre-war systematic attempt to make some sort of chronological and geographical sense of the abundance of material culture was James Harvey Gaul's (1948)[2] *The Neolithic Period in Bulgaria,* which was an exhaustive study of pottery from every area of the

[2] Gaul undertook his research in the period 1938-9. His dissertation was published in 1948, three years after his untimely death.

Bulgarian lands (Todorova 1995: 79). It was during this period and largely thanks to Gaul's work that the vast amounts of cultural material were categorized into the now very familiar "cultures" like Karanovo, the West Bulgarian Painted Pottery Culture, Gumelnitsa, and Hamangia, and many others.

After Gaul, the goal of prehistoric research was to tighten chronological sequences and to synchronize them with the Aegean world and Anatolia (Gaydarska 2007: 7). Such a research agenda fit into the prevailing diffusionist/migrationist framework, with social and technological complexity arising in the Near East and spreading to Europe through the eastern Mediterranean and the Balkan Peninsula. The origins, routes, and dynamics of Neolithization were of primary importance for diffusionist scholars. According to Childe, the earliest expansion of the Neolithic way of life was by colonists (specifically the children of Neolithic peasants) in search of fresh land in order to alleviate population pressure (Childe 1952[2004]:134-5).

Though Childe was careful not to overlook the possibility that 'secondary Neolithic revolutions' were instituted by local Mesolithic populations, the idea that the earliest farming communities in SE Europe were not indigenous was perpetuated by later studies, such as Ammerman and Cavalli-Sforza's Wave of Advance Model (1984).The lack of any evidence for indigenous societies in the territories of much of Bulgaria continues to lend credence to migrationist models, at least as far as the earliest farming communities are concerned (Dennell 1978 156-7; Tringham 2000: 32-33).

Migrationist theories had the unfortunate effect of reducing Bulgaria and the Balkans to their major river systems, as highways first of Neolithization and then metallurgical technology and social complexity. The role of upland and mountain communities in regional settlement patterns was completely ignored and economic and social issues remained largely unaddressed (Athanassov 2012: 2). Nevertheless, in the succeeding period some scholars argued for an autochthonous development of food producing economies and social complexity while others, like Todorova, attempted to synthesize the two frameworks (Gaydarska 2007:9).

The first scientific attempts at stratigraphic excavation began in the post war period, after the takeover of the Communist regime in 1944. During this time excavations at large tell sites in Bulgarian Thrace and elsewhere allowed archaeologists to build much more accurate relative ceramic chronologies for all prehistoric periods, and the results were presented in greater detail, although not always published (Todorova 1995: 79). Georgiev's work on the most famous of Bulgarian tells, Tell Karanovo, fixed the faulty short chronology of Bulgarian prehistory and established a more valid sequence for pottery in Thrace that is still employed, although to this day it has never been published (V.Nikolov 1997:15).

During the 1970s and early 80s the first interdisciplinary projects were undertaken in Bulgaria. A few foreign scholars were fortunate enough to be able to work inside the country, and produced important monographs and reports that made Bulgarian prehistory more accessible to the Western world (e.g. Chernikh 1978; Dennell 1978), although their influence among Bulgarian scholars was either miniscule or controversial (Gaydarska 2007:8).

Profound economic and social changes since the collapse of the Soviet Bloc in 1989 had a twofold effect on archaeological practice in Bulgaria. On the one hand, it opened the door for the possibility of greater collaboration between Bulgarian archaeologists and scholars from Western Europe and the U.S., the positive effects of which can be seen in excavations such as those at Kovatchevo, Blagoevgrad district, a joint Bulgarian-French expedition during the 1980s and 1990s (Lichardus-Itten et al. 2001).

On the other hand, the economic crises that have gripped the country since the fall of Todor Zhivkov's regime have ensured that excavations are now small scale and sporadic (Chohadzhiev 2007: 12). A reflection of this is the increasing reliance on rescue archaeology (*spasitelni razkopki)*, which, mandated by Bulgarian law, ensures that proper treatment will be given to threatened archaeological sites but by definition also ensures that excavation continues to be *ad hoc* and small scale. There are exceptions however: the early Neolithic/Bronze Age site of Yabalkovo, conducted as a rescue excavation, is the largest excavation in Bulgaria to date (Leshtakov 2010; Leshtakov et al 2011).

Rescue excavations are important in modern Bulgarian archaeology not only because they provide funding for fieldwork and publication, but also because they have forced the focus of researchers away from tells. Whereas tell archaeology has completely dominated Bulgarian prehistory until relatively recently, the picture is now emerging of a more complex system of settlements that involves not only tells but flat sites (some ephemeral and some long lived) upland settlements and camps, and now, pit sites. In fact, current funding is better for flat sites and tells go largely unexcavated (B. Athanassov, personal communication).

Today Neolithic research is in a privileged position. Under the larger heading of prehistoric archaeology (which, in Bulgaria, covers the period from the Upper Paleolithic to the Bronze Age), it receives a good deal of attention. Intense regional investigations have led to a better understanding of Neolithic settlement and society in certain parts of Bulgaria (c.f. Grebska-Kulova and Kulov 2007), while numerous syntheses of the Neolithic are available in English (c.f. Chohadzhiev 2007; Boyadzhiev 2009). Despite these inviting trends, one gets the impression that prehistoric research is still overshadowed by classical archaeology, especially where it concerns the Thracians. This is especially evident in the presentation of Bulgarian archaeology to the public, which tends to emphasize Bulgaria's connection with the greater developments of the Greco-Roman world (after all, how can collections of earth tone pottery sherds and crude zoomorphs compete with the splendid 1st mill. BC silver and gold treasures of Thrace?).

Athanassov (2012:2) claims that the lack of a "processual" stage in the development of prehistoric study in Bulgaria is largely to blame for the dearth of economic or environmental data. This picture is also rapidly changing with the more regular practice of dry sieving and collecting archaeobotanical and faunal materials. Non-invasive methods are now widely used in Bulgaria to document prehistoric sites and to target and refine excavations (e.g. Grebska-Kulova and Zidarov 2011).

However the Neolithic is still viewed as a predominantly economic phenomenon, a "package" of material culture that includes pottery and domesticated plants and animals that were imported into the region during and in response to climatic stresses (Todorova and Vajsov 1993, Todorova 2003). In part this is a holdover from earlier archaeological theory in Bulgaria that was a form of "self-evident social processes" based partially on Marxist thought and partially on culture-history paradigms left over from the preceding period (Gaydarska 2007: 9-14): It is still difficult to find discussions of Neolithic communities that do not try to tie them into some supra-regional "culture" and that do not simply focus on their interactions, influences, and communication with other "cultures." Whittle (1996:9) stressed the importance of examining Neolithic sites in their particular contexts. David Orton has similarly called for a site specific rather than regional approach to the study of Neolithic sites in the Central Balkans, especially where animals are concerned (Orton 2010: 189). With these considerations in mind, the way is now wide open for a better understanding of Neolithic society, and the relationships between humans and animals in prehistory.

2.2 The Late Neolithic (ca. 5400-5000 cal. BC)

Originally identified by Georgiev as a separate cultural development in 1961, the Late Neolithic is in fact poorly represented in the tells of Bulgarian Thrace. In addition, what little is present has not been exhaustively published. Finally, identifying the boundary between Late Neolithic and early Chalcolithic, especially in the context of large tell settlements, has proven extremely difficult. Kalchev has argued that there is in fact little difference in terms of material culture from one phase to the next (Kalchev 2004: 218-220). This sentiment was expressed earlier by Sherratt (1994: 170), who argued that difference between Late Neolithic and early Copper Age societies was one of behavior and not technology.

The major differences between the material culture of the Late Neolithic and the early Chalcolithic are to be found in changing artifact typologies, mostly pottery. As with the preceding phases of the Neolithic, these show a good deal of variety even within various regions of the current boundaries of Bulgaria. In the central part of the Thracian plain, Karanovo III/IV ware predominates. It covers the period from the end of the Middle Neolithic to the last phase of the Late Neolithic, and slightly precedes Vinca A-B in the central Balkans, Sitagroi I-II and the Zarkou phase of the Sesklo culture in Thessaly (V. Nikolov 1997: 22).

While not the only or even predominant settlement type during this period, tells continue to be the focus of intense building activities and aggregation of people throughout the Neolithic. Many tells, such as Klisselika and Gudzhova in Upper Trace (Maritsa valley) were occupied intensively from the Early Neolithic to the early Chalcolithic. Houses continued to be deliberately rebuilt over earlier foundations, often times with foundation deposits containing human remains (Bailey 2000: 51-52; Chapman 2000a: 66-69).

In Bulgarian Thrace, the rectilinear house form dominates. Abundant evidence for such construction is found both inside of Thrace (at Karanovo, Chavdar, Samovodyane, Hlebozavoda, Podgoritsa, ,Ezero, and others) and outside (Ovcharovo, Golyamo Delchevo, Galabnik, Kalchitsa, Topolnitsa, and others) (Todorova and Vajsov 1993: 148).

Such a long use of tells also suggests that land use strategies were relatively stable during this period. In Bulgarian Thrace, many tells are located in areas with patchy soil distributions, suggesting that by the late Neolithic (and most probably earlier), the inhabitants of the plain were accomplished mixed-strategy farmers (Gaydarska 2003: 356). In general, then, the Late Neolithic is characterized by ever increasing population sizes and more intensive settlement and use of the landscape (Gaydarska 2007: 1). While tells remain a focus of occupation, it seems ever more likely that they are only spots of permanence in a fluid landscape, or even seasonal occupation zones (Whittle 1996; Bailey 1997).

Unlike the still unresolved debate over the origins of the first Neolithic communities in Bulgaria, the development of the late Neolithic is largely considered to be a continuation or evolution out of preceding indigenous developments (Dennell 1978:6; B. Nikolov 1997:39)[3]

Despite the abundance of formal study of Late Neolithic material culture in Bulgarian Thrace, very little has been expounded on the nature of social organization or complexity. The place of animals in this society is even more obscure, since their roles beyond diet are rarely explored in the local literature. What has been written about changes in social complexity during this period largely comes from non-Bulgarian literature and tends to focus on the tension between community oriented values and ever increasing differentiation that leads to exclusion and social hierarchy, and these ideas must be explored briefly.

[3] Although it should be mentioned that a good deal of this continuity was originally predicated on long lived occupation of tells, a somewhat problematic concept in the last 20 years (c.f. Whittle 1996; Bailey 1997).

2.3 The social environment

Along with the increase in population density and intense use of the landscape is a perceived increase in social complexity. Chapman (2000b: 34-36) has argued that the densification of networks of trade and communication is underwritten by population increase. Increased exploitation of the same resources results in either the establishment of more non-kin based networks of exchange or expanded kin based networks of exchange (enchainment). Eventually, these networks provide the opportunity for differentiation and exclusion through restricted access to exotic goods.

Networks of exotic goods exchange are not the only way for differentiation to occur. Others have argued that the Late Neolithic is a time of increasing private property relations. Russell (1993:13) argues that the roughly contemporaneous Vinca period in the Central Balkans saw the intensification and solidification of private property relations which eventually culminated in hierarchical societies in the succeeding Copper Age. It's tempting to argue the same for other parts of the Balkans, like Bulgaria, especially if we consider the Late Copper Age developments on the Black Sea coast at places like Varna and Durankulak to have arisen from indigenous Neolithic and Earlier Copper Age developments.

Private property or 'wealth' can best be defined for prehistoric societies as:

" the accumulation of personal goods, both common and luxury items, that could be translated into status, be inherited, and, with the passage of generations, result in persistent differentiation between the haves and the have-nots." (Bogucki 2011:108).

Accumulating wealth is much easier among mixed farmers than it is among hunter gatherers, because the possibilities for long-term storage (related to sedentism) are greater. The 'quantum shift' in human-animal relationships that came along with the domestication of herd animals (Russell 2002: 294) instituted the idea of 'divided access' to natural resources (Orton 2009, see also Ingold 1980 Chapter 3 for a discussion on how attitudes toward animal ownership can develop among herding societies). Live animals have a value beyond their meat and hides, through secondary products like dairy and traction. Larger stock, like cattle, are considerably more valuable because they provide more dairy and are the only animals in this period capable of being used for traction.[4] In fact, the increasing importance of cattle throughout the Neolithic and into succeeding periods may be directly related to their importance as draft animals (Pullen 1992; Bogucki 1993, 2011). Of course, all of this implies a greater use of arable land and the increasing potential for the storage of agricultural goods, which makes animals like cattle all the more important.

Animal wealth may have functioned as the primary means of prestige building in the Late Neolithic and into the Chalcolithic in SE Europe. Due to their high value, sacrificing them at feasts would have been not only a display of status but also a way to accrue more, as obligations to reciprocate were created in the process (see the next section). With the introduction of metallurgy after the Neolithic, the potential for wealth accumulation skyrocketed, as is well evidenced by the material record of Southeastern Europe.

The problem with such a model for the Late Neolithic in Thrace is that the relationship between household and community is still not very clear. The economic self-sufficiency of households may have been at odds with their need for help from the larger community

[4] At this point there is no direct evidence for the use of animal traction in Bulgarian Thrace, although it becomes established in the Late Neolithic in Central Europe (Bogucki 2011) and the Final Neolithic/ EBA in the Aegean world (Pullen 1992). The point is that larger stock require more work to raise to a productive state and have the potential to contribute far more in terms of secondary products and that therefore, we can consider them more valuable.

(Russell 1993:6). Some have argued that cooperation beyond the household is a form of risk mitigation (Halstead and O'Shea 1982, Halstead 1989), while others stress the ability of individual households to manage risk on their own, and differentiate themselves from the "unlucky, unresourceful, and risk-averse individuals and households" (Bogucki 2011: 114). The problem with such models is that they reduce social phenomena to adaptive responses to environmental stress (Souvatzi 2008:33).

Another way of looking at community cooperation is in scheduling and performing tasks that cannot be completed by only one household. Agricultural intensification, in the form of monocropping or specialized animal husbandry, would have required greater mobilization of community labor, making the maintenance of social relationships between household and hamlet even more necessary (Bailey 2000: 189). After reviewing the faunal material from Sarnevo, it is clear that hunting should be added to the list of activities that probably required organization beyond the household. For Bailey, this increasing need for cooperation led to large-scale incorporation of people into corporate/kin groups, despite the fact that mechanisms of exclusion were also on the rise in the post 5500 BC world.

Evidence for exclusion in Late Neolithic Thrace might be found in changes to architecture that characterize the period beginning from around 5500 cal BC. There is, in general, an increasing emphasis on demarcation both within houses and within settlements themselves (Whittle 1996: 70; Bailey 2000: 173-176). Internal divisions such as those found in the two Karanovo III houses from Tell Karanovo (V. Nikolov 1997: 16) indicate a general concern with restriction of access to certain persons or certain activities.

At this point, we simply do not understand how economic activities were structured within the context of the larger community. It's useful to remember that far from being an antagonistic dichotomy, households exist in a dialectical relationship to the community, and activities traditionally assigned to the household, such as food preparation and consumption, are often performed at the communal level. Competition and cooperation go hand in hand (Souvatzi 2008: 16). In the next section communal consumption of food will be examined in greater detail as a means of establishing and negotiating social relationships as well as a way of increasing status through competitive hospitality. Animal meat is almost always involved in feasting, yet faunal remains on Neolithic sites are most often interpreted in strictly economic terms. Therefore a brief discussion of attitudes towards animals that transcend their caloric value is necessary. Since both wild and domestic animals are present in large numbers at Sarnevo, it is crucial to understand what distinctions (if any) Neolithic peoples may have made between the two.

2.4 Animals inthe Neolithic

If we are to understand the roles of animals in Neolithic society, then we must move beyond the determinism of models based on subsistence and diet that are still widespread in archaeological literature on early farming communities in Europe. In recent years there has been an increased focus on the social roles of animals in the lives of humans (Marciniak 2005; Orton 2008, 2009, 2010; Russell 2012a,). Such studies have highlighted the fact that humans "maintain animals in ways that accent social relationships" (Marciniak 2005: 238).

A fundamental hurdle to jump in this realization is that amongst Neolithic farming communities, animal protein, especially in the form of meat, likely made up only a small portion of the diet. Speaking for Aegean groups during the Neolithic, Halstead argues that cereal grains made up the majority of the farmers' diets (Halstead 2007: 27). Dennell (1978) has argued the same for some sites in south central Bulgaria during the Neolithic. Living off herds of domestic animals and using only meat is nearly impossible, and is certainly not reflected in Neolithic faunal assemblages (Hayden 1996, Halstead 2007).

The use of secondary products, especially milk, is a much more efficient way of incorporating animal protein into the human diet, but evidence is hard to come by. Dairying was most likely practiced in Late Neolithic Bulgaria, although little work has been done to investigate patterns of herd culling, which is the primary way, in the absence of direct evidence, of identifying this practice (Russell 2004: 325). Live animal wealth is perhaps the most important use of domestic animals in the Neolithic. Having herds of domesticates not only gives people access to their secondary products such as milk, wool, or traction, but also provides them with a sort of currency that can be used in social transactions, such as bridewealth or blood-feud payments, exchange for plant foods in times of scarcity, or, in the end, a ready supply of meat for occasions like feasts. Entire lineages of animals can become an integral part of these social relationships between people (Orton 2010: 194). Animals therefore function as the "vehicles" of social reproduction (Ingold 1984).

This is made possible by the fact that domestic herd animals are a form of personal property, owned individually or collectively and not necessarily subject to the sort of large-scale reciprocity that is characteristic of forager groups. The consumption of domestic animals might be seen as a form of wealth destruction. The argument could be made that herders take extra steps *not* to slaughter their own property. Halstead (2007: 26) argues that it is precisely the rarity of eating domestic animal meat (because slaughtering represented a real sacrifice of live animal wealth) that made it a "special" commodity, of the type that Dietler (2001) mentions in his discussion of special feasting foods (see section 3). Bailey (2000:279) similarly argues that the right to eat certain animals in the context of feasting serves as a primary mechanism for exclusion.

The incorporation of live animals into human society is only possible with domestic animals. Wild animals cannot be owned in the same sense due to the nature of the non-intimate relationship between wild animals and humans and because of the particular biological traits that made them unsuitable for domestication in the first place. In other words, since wild animals cannot be kept and closely managed by humans, their products can only be used after their deaths, and they cannot be integrated in the social lives of humans while they are still alive.

This is not to argue that wild animals do not play important symbolic and social roles for mixed farmers. As indicated earlier, wild animals are extremely important at Sarnevo. In both hunter-gatherer and mixed farming societies hunting is an important means of identity construction (especially male identity; Orton 2009: 13), and wild animal meat may be just as important in commensal hospitality, although not always in the same way as domestic meat (e.g. Russell 2000: 50).

Understanding the exact nature of Neolithic farmers' relationships with wild and domestic animals is perhaps not possible. Certainly there is no reason to believe that they would have constructed categories of wild and domestic in ways familiar to us, nor that they even drew such rigid distinctions between the two (c.f. Hodder 1990). However, given the differences in the abilities of wild and domestic animals to function as wealth, there are grounds for maintaining a very loose dichotomy between wild and domestic (Orton 2009: 6).

2.5 Conclusions

Based on the present state of archaeological investigations in Bulgarian Thrace, and in theoretical understandings of social complexity during the Neolithic, it is safe to say that the Late Neolithic in Bulgaria is a period of population growth and intensification of agricultural and settlement activity. Focus has begun to move away from tells, toward investigating the complex relationship between numerous site types, situated in a fluid mosaic of patterns of mobility and sedentism. The concomitant changes in social organization that go along with these intensifications continue almost seamlessly into the Early Chalcolithic; yet by the end of the Chalcolithic have found their full expression in the highly differentiated burials at sites such as Varna and Durankulak (Chapman et al. 2006).

The establishment and reproduction of social relationships at this time focused on strategies of maintaining community cohesion, necessary for labor pooling for activities like planting, harvesting, or hunting, while at the same time competing for status in an ever more accumulative and exclusionary society. As the next section will show, commensal hospitality serves both these ends.

Animal meat is a nearly universal currency in commensal politics (Twiss 2008: 423), and animals themselves are tied up in human social relationships. When encountered in special contexts in large numbers, as at Sarnevo, economic interpretations of animals' caloric contribution to human diet or nutrition are insufficient. Before proceeding to the report of the fauna from Sarnevo, a discussion of just how animals function in this capacity is necessary.

3: Feasting and Animals in Archaeological Context

This section examines some of the current anthropological and archaeological ideas about feasts, as consumption events that differ from those of the household or “everyday”. Much has been written in archaeology about the importance of feasting in the past few decades (Hayden 1990, 1996, Dietler 1996: Hayden and Dietler 2001; Twiss 2007, 2008; Hamilakis 2008; Hamilakis and Sherratt 2012), and it is not possible here to give proper treatment to all that has been said. Rather, I prefer to discuss what I feel are the relevant aspects of feasting for small-scale, mixed-farming communities like the ones in Late Neolithic Bulgarian Thrace. I also consider the importance of animals in communal consumption and commensal hospitality, and finally some of the archaeological correlates typically used to identify feasting, and their presence or absence at Sarnevo. The zooarchaeological evidence for feasting will be discussed more thoroughly as the remains are treated in more detail in Section 5. The implications of feasting at Sarnevo will be explored further with a spatial analysis of the pit features in Section 6.

3.1 Feasting in the Neolithic: definitions and characteristics

Definitions of feasts vary, with some authors stressing their economic dimensions (Hayden 1996, 2001), their political aspects (Dielter 1996, 2001), or their theatricality (Hamilakis 2008; Hamilakis and Sherratt 2012). Most generally agree that feasts entail the ritualized consumption of food and drink that differs from ordinary, everyday consumption and it is this definition that I find most useful. Perhaps the most important consideration for feasting during the Late Neolithic is that feasts are simultaneously cooperative and competitive (although cf. Hayden 1996: 128 for a different view). The interplay between trying to maintain community solidarity and political maneuvering to establish inequality is common to what Dielter (1996, 2001) has called entrepreneurial or empowering feasts, and is what makes feasts so important to the political economy.

Cooperation is necessary for households to secure the labor needed to carry out important and time-specific tasks such as planting, harvesting, herding, or some forms of hunting, which almost certainly must be done beyond the household. In the post-5500 BC period of intensification of agriculture and stock breeding (Bailey 2000: 189; see Section 2), the need to develop social networks would have increased tremendously as a way to manage these important tasks. Social networks may also have been an important factor in mitigating risk (Wiessner 1982, Halstead and O'Shea 1989), or in solidifying ties in increasingly dense exchange networks (Chapman 2000: 31-2).

At the same time, the increasing role of exclusion and incorporation in Late Neolithic society served to promote household competition and inequality by limiting access to agricultural goods, technologies, and social information (Chapman 1981, Tringham and Krstic 1990, Whittle 1996, Bailey 2000). This 'privatization', the intensification and consolidation of private property relations, has been argued to play an important role in formalizing social inequalities elsewhere in the Balkans. The tension between the household as an independent producer and its need to rely occasionally on other households is ameliorated through hospitality, often in the context of feasting (Russell 1993: 6). And because feasts are usually large, lavish events that require an input of labor and resources from more than just a single household, commensal hospitality links the domestic and political economies of a community (Dietler 1996: 89).

Commensal hospitality is a special form of gift exchange whereby destructible commodities (food and drink) are traded and then consumed. This exchange, coupled with unique sensory perceptions (see below) and the gathering of large groups of people, promotes a sense of community solidarity. Yet the reciprocal obligations created by this exchange serve to create categories of superior/inferior until the "debt" is paid back. These gifts can only be reciprocated by reinvesting future labor into the production and preparation of more food and drink. While power relations may not be explicit during feasts, they are often at the heart of commensal hospitality and can in some instances promote the development of more permanent forms of inequality (Dietler 1996: 90-95).

The organization of large-scale feasts as may have taken place at at Sarnevo necessarily requires a large amount of agricultural production. That means that all households are aware from the very beginnings of production that the products of their labor will be mobilized for purposes outside of the household. It also means that a large proportion of the agricultural products a community creates will be earmarked for such purposes. Feasts are therefore crucial in that they provide a place for the organization of these social ties that determine how agricultural labor is to be executed (Dietler 2001: 82).

Comparing feasts with quotidian meals can be tricky. The privilege granted to feasts as extraordinary events that reproduce social relationships, identities, and inequalities runs the risk of relegating ordinary consumption to the realm of the strictly biological; something that humans do but that has no meaning (Hamilakis and Sherratt 2012:190). Twiss has argued that there is a tendency in archaeological thought to oppose feasting and everyday consumption diametrically, when in reality, they exist on a consumption continuum that ranges from light snacking to elaborate feasts (Twiss 2007: 51). Though she stresses this dialectical relationship, Twiss maintains that there are real differences between consumption at the household and communal levels.

Scale is one way that feasts typically differ from everyday meals. Just how large a gathering needs to be to be considered a feast is debatable. Most scholars decline to give a minimum number, although Hayden feels that feasts may be shared between as few as two people (Hayden 2001: 28). The act of consumption within a group context, coupled with the elements of performance described below, promotes a sense of community solidarity that cannot be replicated at the scale of the household.

Theatricality is another aspect that differentiates feasts and everyday meals. Hamilakis argues that the highly ritualized and theatrical nature of feasts serves in the creation of a “mnemonic record”, the memories of sensory experience that are preserved in the minds of participants as breaks with the ordinary memories associated with quotidian meals (Hamilakis 2008: 15-16). Singing, dancing, storytelling, the cries of sacrificed animals, the sight of blood, and the smell of cooking meat are all ways in which the theatricality of feasts plays on the senses and creates distinctive memories.

In outlining some of the key components of feasting , it has been my goal not to settle on one all-encompassing definition, or to suggest that feasts serve only one purpose (creating memory, reproducing social relationships, etc), but rather to consider what are likely to have been some of the critical components to communal consumption in prehistoric Bulgarian Thrace: the articulation of social relationships (both within the community and perhaps without), performance, animal sacrifice, and gift exchange to name a few. To be fair, feasts are not the only arena for political action (Dietler 2001), and quotidian meals serve also to reproduce social relationships (Twiss 2007). Based on this discussion, I will argue throughout this thesis that the deposits at Sarnevo would seem to derive from feasting activities rather than household consumption.

3.2 Animals in feasts

Meat is most commonly the dominant food at feasts cross-culturally (Twiss 2008: 423; Russell 2012a). Both wild and domestic animals may be consumed at feasts. As we saw in Section 2, the people who used Sarnevo as a feasting ground hunted wild animals in addition to herding domestic ones.

Domestic animals, and especially large-bodied taxa like cattle, are especially suited for feasts. This is due in large part to the fact that without the possibility of long-term storage, their meat must be consumed by groups larger than a household or extended family (Halstead 2007; Table 1). But killing large-bodied herd animals also represents a contradiction in the ethos of herding, which inclines one to hoard animals rather than destroy them and give them away (Halstead 2007: 27; Twiss 2008: 423).

Large herd animals represent a significant investment of labor and resources, and slaughtering them may be seen as a form of wealth destruction (Ingold 1980). In the competitive nature of gift exchange, the more animal wealth one can distribute the more prestige one accumulates. The reciprocal obligation created by this “sharing” creates a social debt that must be paid off. Contrary to truly reciprocal relationships, however, is the fact that inevitably some people will constantly be stuck in an inferior position (unable to mobilize the resources to pay back the debt) and differences in status will be highlighted, eventually formalizing into more concrete forms of inequality (Bogucki 1993; Chapman 2000: 31).

Where high concentrations of large-bodied taxa are encountered in the archaeological record, communal consumption is most likely. In some cases, as in Classical Greece, domestic animal meat was only eaten in the contexts of religious and/or political feasts (Gilhus 2006: 17), and herding strategies may be shaped by the need to produce a surplus, often years in advance, to supply the feast (Twiss 2008: 422; Russell 2012a: 390). Where plant remains form the staple of the prehistoric diet, as in Neolithic Greece (and probably in Neolithic Thrace as well) eating the meat of domestic animals may be symbolically important because it is a rare event (Halstead 2007: 27).

Table 3. 1. Carcass size and corresponding taxa, according to Halstead (2007)

Small carcasses (able to be consumed by a small household of 6-10 persons)	Infant piglets (0-2mo), infant lambs and kids (0-3mos)
Intermediate carcasses (smaller carcasses of larger animals for consumption by larger households)	infant calves (0-1mos), young piglets (2-6mos), older lambs/kids (3-12 mos but small), elderly females in poor condition (6+ years)
Large carcasses (too large for a single household to consume fresh)	post infant cattle (>1 mo), older piglets, yearling, and adult pigs (>6 mos), and yearling and older sheep/goats (> 12 mos)

Providing wild animal meat for feasts has slightly different implications, since among herders (and hunters) wild animals do not represent wealth in the same way as domestic animals. Nevertheless, they may also be "stored up" through the use of hunting taboos on certain species, lifted when the time comes to provision the feast (Twiss 2008: 422). However, killing large numbers of wild animals may trigger a feast, as is often the case among hunter-gatherers (Russell 2012a: 380). In cases where these animals are migratory, killing them and holding feasts may be seasonal events. Where domestic animals form an important part of the economy, taxonomic diversity is often considered a sign of feasting (Hayden 1990, 1996; Twiss 2007, 2008).

As Section 5 will show, the domestic to wild ratio at Sarnevo is close to 60:40[5]. The proportion of wild species is high in comparison to many sites in Bulgaria and in the surrounding regions (Table 2). As David Orton (2009) has rightly pointed out, there is no reason to believe that hunting among mixed-farmers is in any way anomalous. Rather than becoming rarer as agricultural activity intensifies, wild animals continue to make up significant portions of faunal assemblages across the Balkans. This is not to suggest that wild animals were only hunted and consumed in feasting contexts.

[5] When calculated by diagnostic zones. When calculated by number of identified specimens (NISP) it is closer to 70:30, but this most likely reflects the overrepresentation of domestic cattle.

What I am suggesting, rather, is that as large-bodied taxa, wild animals such as red and fallow deer and aurochs serve to increase the prestige of those who hunted them in a similar way to how herders use their domestic animal wealth to accrue prestige through generously "donating" their animals to the entire community. Among hunter-gatherers generosity through meat sharing occurs much more frequently, but among mixed-farming groups is likely to occur on a more punctuated basis, at special occasions such as feasts (Russell 2012a: 383).

A final consideration is the role of animal sacrifice at feasts. The highly visceral and emotive act of sacrificing a live animal, including the auditory and visual sensations that go along with listening to the cries of the victim and seeing its blood are part of what creates the "mnemonic record" that Hamilakis regards as the central aspect of feasts. But identifying animal sacrifice is not straightforward: it is even more difficult from archaeological remains. Cut marks on the ventral side of cervical vertebrae have sometimes been taken to indicate sacrifice (Højlund 1981, Bökönyi 1993). However, this may only reflect the method of slaughter, and nothing more. Another potential indicator is the deposition of entire or partially complete skeletons, as is the case with the Roman period horse burial from Feature 43 at Sarnevo.

It is often argued that only domestic animals can be sacrificed, as only they are "owned". One can only sacrifice one's own property (Russell 2012b: 85). Also, sacrifice entails a transfer of the animal's spirit from the human world to the divine. This is usually done through prayers and other ritual behaviors, and must be done while the animal is still alive. It is difficult to do this with a wild animal, unless it is captured first.

Recognizing sacrifice at Sarnevo is problematic, made more so by problems with definitions. If we take Russell's advice and define sacrifice as ritual killing, then there is little in the zooarchaeological record that may lead us to the conclusion that an animal was in fact sacrificed. There are no complete or mostly complete carcasses among the faunal remains from Late Neolithic Sarnevo (a nice contrast is provided by the Roman period pits from the site, some of which contain dog and horse sacrifices), and apart from one tentative example on a sheep atlas, there are no butchery marks indicative of the method of slaughter.

If sacrifice differs from slaughter only in the social context and intentions of the killers (Russell 2012b: 89), then in the absence of literary sources or artistic representation we may never have a definitive answer as to whether animal sacrifice took place at Neolithic Sarnevo. The best we can do is to recognize that sacrifice is common in feasting contexts, and was probably common in prehistory as well. It is perhaps no coincidence that animal sacrifices (almost exclusively of domestic animals) take place during the same kinds of crucial life ceremonies that Dietler (2001: 72) claims are often marked by feasting: birth, death, marriage, agriculturally important occasions, etc. (Russell 2012b: 86).

3.3 Recognizing feasts in the archaeological record

When feasts are large communal affairs they often involve copious amounts of food and drink consumed (sometimes) in unusual places,and therefore have the potential to be quite recognizable archaeologically. However, it is only within the last two decades that feasts have been given serious consideration by archaeologists (Hayden 1996; 2001). The reasons for this may be an inappropriate emphasis on subsistence in archaeological studies (Dietler 2001; Russell 2102a), or an unwillingness to deal with aspects of human behavior (gluttonous eating and ingesting narcotic substances) that are considered offensive to “middle class sensibilities” (Hamilakis 2008: 4).

Archaeological correlates for feasting must be drawn from all types of material culture. Hayden identifies numerous indicators of feasts, including special foods, special vessels and features, prestige items, and feasting facilities (Hayden 1996: 138-140). Twiss has done an excellent job in enumerating the faunal correlates of feasting, including large amounts of animal bones, presence of large species, both wild and domestic, special deposition of faunal remains, and more (Twiss 2008: 420-422). Hamilakis and Sherratt have recently provided a list of a number of consumption and performative events and the archaeological criteria that identify them (2012: 188).

Special vessels used in the consumption of food and especially drink (alcohol) are often necessary for feasts. They serve the practical function of holding liquids, but are also important in that they serve to promote or deny social solidarity within feasting contexts. At sites such as Knossos on Crete for example, an increase in pouring and individual drinking vessels is attested from the LN with increasing intensity during the EBA. Earlier forms are larger (chalices) and were used to share drinks among a group. Later more individualized cups become predominant, suggesting a more individualized mode of consumption (Hamilakis and Sherratt 2012: 190-191).

The form of ceramic serving vessels may also factor prominently into the theatricality of feasting. Vessel forms that emphasize the act of pouring, such as the "teapots" of EBA Crete and elsewhere in the Aegean, draw attention to the *demonstration and performance* of hospitality (Ibid.). Often, although not always, these ceramic vessels may be deposited along with the refuse from feasts in specialized features.

At Sarnevo, large amounts of ceramics were indeed deposited in the pits alongside the animal bones (Tonkova et al.: 2008; Bacvarov, et al.: 2009, 2010). They are mostly locally made ceramics of the Karanovo III/IV type, and are heavily fragmented, and broken prior to deposition; however, some intact forms were discovered (Bacvarov 2010 and also personal communication)

Performances at feasts include singing, dancing, and storytelling (Dietler 2001; Hamilakis 2008; Twiss 2008; Russell 2012a). This entails the use of special costumes that may be made from a variety of materials, including animal bones. The remains of animals not normally used for food, such as certain species of birds, may be present in the archaeological record as parts of costumes. This has been suggested for the crane wing bones at Çatalhöyük by Russell and McGowan (2002). The bird remains at Sarnevo are not included as part of this study; they should be analyzed with these considerations in mind.

Special foods are also potential indicators of feasts (Hayden 1990,1996; Twiss 2008; Russell 2012a). These must always be interpreted in the context of everyday consumption (Russell 2012a: 389). For the Neolithic Levant, Twiss has argued that cattle were more prominent in feasting than in quotidian consumption, where domesticated caprines were the primary food animal (2003, 2007: 59).

Cattle are the most abundant taxon at Sarnevo. If the evidence for feasting drawn from other sources holds up, then it would seem tht cattle are important in communal consumption. However, the high occurrence of fallow deer (*Dama dama)* in the pits at Sarnevo suggests to me a real preoccupation with hunting these animals. Though they are encountered on archaeological sites throughout Neolithic Bulgaria, they are not usually present in such high numbers. At Sarnevo they comprise nearly 69% of the wild species at the site, much higher than that reported for Drama by Manhart (1998: 44% of wild species) (Popov et al. 2007: 44). Fallow deer may have represented a special feasting food: important because they were rarely eaten in household contexts or because they had some sort of symbolic significance, perhaps related to their large, elaborate palmate antlers.[6]

Special facilities are another common aspect of feasting. These include places for the preparation of food like ovens, roasting pits, spits, and hearths. Along these same lines, we

[6] While this is a tempting argument, and fallow deer antlers do factor prominently in other archaeological sites in Bulgaria, the occurrence of *Dama* antlers is very low in the pits at Sarnevo, mostly due to the high degree of fragmentation. Moreover, elaborate "headgear "is oftentimes removed to special locations and does not find its way into refuse deposits (c.f. Simoons and Simoons 1968 for a good example involving cattle horns). However, it may be possible through metrical analysis to determine the relative proportion of male deer to female.

might expect to find other artifacts related to the processing of food, such as grinding stones or stone tools. Tonkova et al. (2008: 164) reported finding a large oven as well as scattered pieces of grinding stones in the first excavations at Sarnevo. Though they originally identified the context of these items as a house, subsequent excavations have cast doubt on this interpretation (Bacvarov et al. 2009, 2010).

The oftentimes rapid accumulation of animal bones and other feasting gear necessitates a special way to dispose of the feasting “trash”. In addition to the practical problems of how to deal with food refuse that will become rotten and attract unwanted vermin and insects, there may in fact be a very real need to dissipate the power of the feasting remains by securing them away from everyday contact, through rapid burial, burial in pits or ditches, and trash fires (Russell 2012a: 390). These may also be the reasons for holding feasts in unusual locations.

Probably the best evidence for feasting at Sarnevo is the presence of large pits with rapid, single-event deposits of copious amounts of animal bones and ceramics contained within. Furthermore, as shown in Section 1, the largest and most elaborate of these pits were given a special treatment both before and after deposition. Their walls were coated with a grayish, sterile clay, and their deposits were “capped” with large pieces of burnt daub from house walls; houses that appear to be absent at the site. Clearly great time and effort was expended in digging and sealing away this “trash”.

3.4 Conclusions

The brief treatment given to feasting here has not even begun to explore in depth all of the socio-political issues that have recently been discussed in the anthropological and archaeological literature. Rather, it has been my aim to parse out some of the key characteristics of feasting, those which I feel are most pertinent to communities who practice a mixed strategy of cultivation, herding, and hunting. The review of animals in feasting has been similarly cursory, and has mostly focused on their roles as providers of meat and animal wealth, expended in the context of feasting through gift exchange and hospitality aimed at prestige building.

Unfortunately it is difficult to understand feasts without being able to compare them to everyday meals (Twiss 2008; Russell 2012a). Zooarchaeological analysis of villages and other “domestic” sites needs to focus on animal remains in a context-specific way that is cognizant of the expanded roles of animals in the lives of prehistoric peoples, including in everyday consumption. At this point, I can only offer the suggestion that the pits at Sarnevo most likely represent the result of large-scale feasting activities. The archaeological correlates, as many and varied as they are, must be evaluated in conjunction with other lines of evidence.

4. Materials and methodologies

This section discusses the materials and methods used in the analysis of the faunal assemblage from the Late Neolithic at Sarnevo. Of 10,348 bone fragments, 4004 are diagnostic. The remaining 6344 fragments too small for identification beyond element type and size class were grouped into undiagnostic or “scrap” categories.

4.1 Excavation, curation, recording

As mentioned in section 1, the bones were collected over three field seasons during rescue work prior to the construction of the AM “Thrakia” Highway. The Late Neolithic bone material was recovered from two distinct contexts: pit features, which varied in size and form, and Layer 2, which is the Late Neolithic occupation surface into which the pit features were dug. To simplify matters, I use “pit” and “non-pit” to refer to the two contexts, where “non-pit” refers to Layer 2. This analysis focused entirely on the western portion of the site (Sector Central), which contains the majority of the Late Neolithic pits. Some pits were excavated on the eastern portion of the site, and a portion of the middle area has yet to be excavated. The western pits were chosen because they were greater in number, larger, and because many on the eastern part of the site were disturbed by later Iron Age and Roman period features. Furthermore, the only published data on animal remains come from the Sector Central, in a master’s thesis from New Bulgarian University (Karastoyanova 2011), providing an opportunity for comparison with the nearby pits.

Once out of the field the remains were stored in the laboratory at New Bulgarian University under the care of Petar Zidarov. They were analyzed using a partial reference collection assembled in the lab and a number of osteological atlases. Bones were recorded using a (slightly) modified version of the faunal coding system used by Nerissa Russell and her team at Çatalhöyük, itself the offspring of BONECODE, developed by Richard Meadow. The relational database uses Microsoft Access as its operating platform. Detailed recording procedures are described below.

All identifiable bone fragments receive their own record in the database. This record receives a General Identification Number (GID), which serves as the unique identifier for that specimen throughout the database. For the material collected at Sarnevo, the GID looks like:

47.1.1

where 47 is the feature number, 1 is the bag number, and 1 is the specimen number.

Where materials were recovered from Layer 2 (non-pit), the first number corresponds to the quadrant where the bones were recovered. Therefore:

10510.1.1

refers to quadrant 105/10 (see map, section 1), bag 1, specimen 1.

Unidentifiable fragments were grouped together in "scrap" categories and weighed together. 'Scrap" includes long bone fragments where less than ½ of the total circumference of the shaft is present, scapula blade fragments, cranial fragments that are too small to determine which region of the skull they come from, rib fragments, and *all* vertebrae except the axis and atlas. The scrap categories were further separated into taxon size classes:

(3) Small (sheep/goat/roe deer sized)

(6) Medium (Pig/fallow deer sized)

(7) Large (red deer/cattle sized)

An additional size category (2),Hare sized was occasionally used for elements that were smaller than sheep or dog but were not micro fauna. Code (1) was used for micro-fauna, which, like birds and molluscs, were only quantified and not analyzed. Finally, in the most dire circumstances, the code (117) “Indeterminate” was used if the bone was so fragmented that no useful information could be gleaned.

All of the bone fragments exhibit roughly the same degree of weathering: they are chalky and cream colored. They show little evidence of sub-aerial weathering corresponding to Behyrensmeyer’s (1978) weathering stages, suggesting that they were not left exposed to the elements for very long. Many of the fragments were covered in a calcareous concretion, most likely as a result of the sterile clay used to coat many of the features prior to deposition. The soil in this part of Bulgarian Thrace is largely made up of *smolnitzas*, which grade quickly into a Ca horizon, causing these concretions in the soil (see section 1).

The faunal remains were collected over both field seasons by students from several Bulgarian Universities and local workers using pick-axes, shovels, and trowels. The soil was not dry-sieved, and the bones were not washed prior to being brought to the laboratory at NBU. Because of the lack of sieving, element representation may be biased towards the larger, more robust elements (articular ends of limb bones, mandible fragments, teeth, etc.), with smaller elements such as phalanges, tarsals and carpals underrepresented. Smaller taxa such as birds, rodents, and mollusks may also be underrepresented. To investigate the effectiveness of recovery techniques a test was applied following Maltby (1985), whereby the number of second phalanges are expressed as a proportion of the number of first phalanges. These elements share similar densities, are often not separated during butchery, and occur in similar frequencies throughout the body. There are a number of methodological issues concerningwhich species should be included in such a test that can lead to some problems with the method (Maltby 1985: 38-9). Since the phalanges of smaller-bodied species (such as sheep/goat) are not as large as cattle, comparing frequencies of second to first phalanges for both taxa should give an indication as to the effectiveness of recovery methods on smaller specimens (Russell and Martin 2005: 49). Only cattle and sheep/goat/roe deer phalanges were included in this test. Since recovery methods were the same for pits and non-pits, the contexts have been combined. The results from the test are presented in Table (4.1).

Table 4. 1 . The "Maltby" test of recovery efficiency for both large and small taxa

Large sized			
	First	Second	Second/First
NISP	94	47	50
DZ	47.5	23.5	49.47368
Small Sized			
NISP	8	6	75
DZ	4	3	75

For the large taxa, second phalanges were recovered less often than first: about half as many when counted both by fragments and by diagnostic zones.

The picture for the small size class is somewhat misleading. While the percentages would seem to suggest that recovery was in fact better for this size class, the small numbers both of identified specimens and diagnostic zones make this calculation almost meaningless. Given their much smaller size, it is likely that both first and second phalanges of sheep/goat/roe deer were less likely to be recovered without systematic sieving of the soil.

It is therefore probable that the faunal assemblage from Sarnevo, both within pit features and without, suffers from a recovery bias that tends to underrepresent smaller elements and smaller taxa. With such a bias in mind, we can proceed to a consideration of taphonomy.

4.2 Taphonomy: Methods

Before any real quantification or analysis can begin, the taphonomic processes likely to have affected the assemblage must be assessed. To do this, a tri-partite analysis was undertaken, following Arbuckle et al. 2009, who used three separate indices to measure non-anthropogenic sources of bone deletion: the humerus index, the completeness index, and the percentage of carnivore gnawing.

The humerus index is aimed at identifying the extent to which density mediated attrition has affected the bone assemblage. It is calculated by expressing the ratio of proximal ends of the humerus to the total number of specimens of the proximal and distal humerus. Since the proximal end of the humerus has a lower bone density than its distal counterpart, this ratio should roughly measure the degree to which low-density fragments were deleted (Ibid.: 146). Here the humeri were grouped into small, medium, and large-bodied taxa in order to measure differences in density-mediated attrition by size class. The results are presented in Table (4.2)

Table 4. 2. Humerus index, contexts seperate

		PITS			NON PITS		
Large (cattle) sized							
		#	%			#	%
Total humerus (proximal+distal)		46	23.91304	**Total humerus (proximal+distal)**		13	0
Proximal		11		Proximal		0	
Medium (Pig) sized							
Complete Humeri		37	16.21622	**Total humerus (proximal+distal)**		21	4.76
Proximal		6		Proximal		1	
Small (sheep) sized							
Total humerus (proximal+distal)		45	17.77778	**Total humerus (proximal+distal)**		15	6.67
Proximal		8		Proximal		1	

Table 4. 3. The humerus index for contexts combined.

		COMBINED	
Large-bodied (cattle sized)			
		#	%
Total humerus (proximal+distal)		59	18.64
Proximal		11	
Medium (Pig sized)			
Total humerus (proximal+distal)		58	12.07
Proximal		7	
Small (Sheep-sized)			
Total humerus (proximal+distal)		60	13.33
Proximal		8	

For pit features, the percentages of proximal humeri are low, under 18% for medium and small-bodied taxa and just over 23% for large-bodied taxa. The sample size is so small for non-pits that these proportions are probably meaningless. When pit and non-pit contexts are combined (Table 4.3), these proportions change little, but the index for each size class decreases slightly. The slightly higher proportion of large-bodied humeri might be a reflection of their higher density relative to smaller-bodied species.

In their study of sheep and goat husbandry at various sites in Anatolia, Arbuckle et al (2009, 146) reported a humerus index for each site under 13%, suggesting that density-mediated processes were a significant factor in bone loss. The results presented here suggest the same:

density-mediated attrition is a significant contributing factor to bone loss in both contexts at Sarnevo.

The completeness index (CI), first introduced by Marean (1991), is intended to measure the effect of post-depositional breakage in a faunal assemblage, by measuring the degree to which smaller, more compact elements such as carpals and tarsals are intact, placing them in one of 5 categories: 0-25% complete, 25-50%, 50-75%, 75-99%, and 100% complete. Since these bones are typically very dense, and have little nutritional value, they should be less affected by anthropogenic forces (such as processing for meat, marrow, or bone grease), and any breakage is most likely due to natural processes. Marean proposed using the following elements: astragalus, navicular-cuboid, cuneiforms, fibula, magnum, unciform, lunate, scaphoid, pisiform, and sesamoids (1991: 692). Although he calculated the completeness index individually for each of the elements, here I have combined them assuming similar density and likelihood of survival. Furthermore, as Marean pointed out, different-sized species will show differential destruction in these compact elements, with smaller-bodied species such as caprines having a higher survival rate than larger species such as cattle (Ibid.: 687). Therefore the CI, like the humerus index, was calculated separately for each size class. These results are presented in Table (4.4).

Table 4. 4. The Completeness Index (CI) for both contexts

PIT	
Size Class	**Completeness index**
Large	91.58
Medium	94.37
Small	98
NON-PIT	
Size Class	**Completeness index**
Large	93.47
Medium	89.72
Small	100
Taxa Combined	**Completeness index**
Pit	91.74
Non-Pit	89.44

Immediately one can see that all size groups showed very high completeness indices, with smaller-bodied species represented by almost all complete elements. For medium and large-bodied taxa the picture was similar: neither assemblage was less than 90% complete. The numbers for non-pit features are slightly lower (except for small taxa, 100% complete), but still show high degrees of completeness.

Two problems immediately surface. The first is the effects of recovery bias on the assemblage. Small species such sheep/goat/roe deer may be overrepresented by complete elements because the fragmented remains of these small bones may not have been recovered. As shown earlier in this section this is definitely a possibility. Overrepresentation of complete elements may be less of a problem for large species but might similarly result in a higher proportion of complete elements relative to incomplete ones. If this is the case, the completeness index may not be as reliable an indicator of post-depositional factors as one might hope.

The second issue is the fact that while the CI might speak to the intensity of post-depositional processes on bone deletion, a high CI might only show that such factors were not so intense as to destroy the densest bones. That is to say that post-depositional processes could have been a significant factor on less dense bones, such as long bones and axial elements, whilst not being strong enough to affect carpals or tarsals.

Carnivore gnawing is another factor that is well known to cause differential deletion of bone from archaeological assemblages. Carnivores (mainly dogs) may either gnaw off the ends of long bones, swallow them completely (Russell and Martin 2005: 41), or remove the entire bone from an assemblage as they carry it away for gnawing elsewhere. When dogs swallow smaller bones, they leave characteristic digestion marks in the form of pits. Digestion contributes further to attrition of bone assemblages in that less dense bones may not survive to be passed through the excrement of the animal, and the excrement itself may be deposited away from the location of the assemblage or removed by human agents. No digestion was observed on any of the specimens from Sarnevo.

Carnivore gnawing affected only a very small percentage of the bone material from Sarnevo (n=53 for the pits, and 19 for non-pits: Table 4.5). This is similar to the pattern observed by Karastoyanova (2011: 109), who reported carnivore gnawing on only 1.36% (n=37) of the material from Feature 9. This low percentage makes sense if the pits were rapidly filled in and covered over, but the lack of significant carnivore activity on the material from non-feature contexts, which would have presumably been left open to carnivores for a longer period of time, is worth noting. Perhaps dogs were discouraged from scavenging on the remains or were prohibited from being on site.

Table 4. 5. Carnivore attrition

PIT	**NISP**	**%**
	79	2.18
NON-PIT	**NISP**	**%**
	48	4.17

4.3 Taphonomy: Discussion

Post-depositional processes, which differentially affected the less dense elements of the skeleton of all size classes, were a significant factor at Sarnevo. The CI suggests that they were not so destructive to have deleted the most dense elements, such as carpals and tarsals. Sediment compaction is one of the ways that bone can become extremely fragmented after deposition (Klein and Cruz-Uribe 1984: 70), but was probably not an issue at Sarnevo. Carnivore gnawing is an insignificant agent in bone deletion at the site. This leads me to believe that the majority of the breakage in the assemblage at Sarnevo was pre-depositional, a thought that I will turn to in section 5. Despite these taphonomic forces, over 4000 elements were complete enough to be considered diagnostic; far better than some other Neolithic collections observed by the author during the period 2011-2012. The two biggest shortcomings in the taphonomic analysis thus far are 1.) the small sample size, especially for diagnostic zones, and 2.) the hitherto unstudied effects of the soil chemistry of this region of Bulgarian Thrace (described in section 1) on the post-depositional fragmentation of the bones.

The sample size issue might be corrected in the future by examining the remainder of the Late Neolithic pits from the site, although additional excavations with more rigorous sampling are impossible, as the Trakia Highway project is nearly complete. Such procedures are urged upon excavators working in rescue archaeology, especially for sites that may be similar to Sarnevo.

4.4 Quantification

Methods of quantification vary widely in zooarchaeological literature, and ultimately must be selected based on the assemblage and the research questions posed. Some quantification schemes are considered to be seriously problematic, while others possess only a limited utility based on the material present or the research agenda. For good reviews of quantification in zooarchaeology, see Grayson (1984; also: Lyman 1994; O' Connor 2000; Reitz and Wing 1999). Here I shall discuss only those methods that were applied to the material from Sarnevo.

4.4.1 NISP

Number of identified specimens (NISP) is the most commonly used measure of quantification in zooarchaeology, and is calculated by adding up all identified specimens of a particular taxon. Specimens may be assigned to species, genera, or broader size classes (i.e. *Artiodactyl; bovid; large, medium, or small mammal*).

The problems of NISP have been discussed *ad nauseum* (Grayson 1984; Klein and Cruz-Uribe 1984; Lyman 1994 to name but a few of many). Perhaps the biggest is interdependence, where one bone element may contribute many fragments to the assemblage, leading one individual to be counted many times over during analysis. Though there is argument about just how much of a problem this is in archaeological collections, especially depending on taphonomic factors (Gautier, 1984), in general it is felt that NISP tends to over-represent larger species with more robust limb elements.

Despite these and other drawbacks, NISP is still the most commonly encountered quantification scheme in zooarchaeological analyses today. In the Bulgarian literature, NISP is always present as the first means of calculating relative abundance, oftentimes alongside some minimum numbers calculation. In fact, perhaps one of the most useful characteristics of NISP is that is so universal in faunal studies in the Balkans (and most other places), that it allows for relatively easy comparison across assemblages. Partly for this reason I have decided to present it as a quantitative scheme, and also because I feel it is useful as a comparative measure when coupled with other methods, like MNE or diagnostic zones (see below).

It is still important, however, to be clear about just how NISP was calculated at the time of analysis. Though it is relatively straightforward, there can be some variation between samples and between analysts (Lyman 1994: 44). By *specimen,* I count any discrete bone unit. For diagnostic fragments, this will include information about which element the fragment belongs to and also some taxonomic category (*Bos taurus*, large artiodactyl, smaller than sheep, etc.).

To account for articulations between skeletal elements (rare in this assemblage), elements that were found to articulate with each other were counted as 1 specimen. This was mostly an issue with mandible fragments that had multiple teeth still present in their alveoli. Fragments with modern breaks that were from the same element were usually glued back together in the lab. Where this was not possible, they were recorded in the same record and given a fragment count of 1. Fragments with ancient breaks that also seemed to come from the same element (much harder to determine) were kept as separate specimens.

4.4.2 MNI

Since the drawback of fragment counts were identified early on, alternate schemes of quantification were developed to try to counteract these problems. Minimum number estimates attempt to account for interdependence by ensuring that it is impossible for one individual to be counted more than once in the sample. Traditionally MNI is calculated by taking the most abundant identified element (e.g. left distal humerus). Minimum numbers of individuals (MNI) is the most frequently used minimum numbers estimate in Bulgarian literature, but was excluded in this study for a number of critical reasons.

The first are the quantitative issues with MNI. When calculated in the traditional manner MNIs are not additive. They must be recalculated with each sedimentary unit, context, or building horizon (O'Connor 2000:60). They are then not valid in statistical tests or in calculations of proportions, since addition is required for both (Watson 1979: 128).Grayson (1984) has shown how MNI counts can vary at different levels of aggregation, therefore calling into question how reliable they actually are. At a site like Sarnevo it would be misery to continuously recalculate MNI for a feature by feature description or a discussion of possible grouping of features. This problem becomes even more pronounced when the possibility exists that carcasses were shared between different pits.

This leads into the second reason for its omission, its appropriateness as a quantitative measure given the research questions being asked. Is the end goal to find out how many animals contributed their body parts to the pits at Sarnevo? If the remains are indeed from feasting trash, it would be more useful to understand how many meaty portions of animal skeletons are being consumed and deposited in the rapidly filled pits at the site. This requires a slightly different minimum number calculation.

4.4.3Minimum Number of Elements and Diagnostic Zones

In order to deal with some of the issues of NISP and MNI outlined above, I use diagnostic zones (DZ, following Watson 1979) as an additional quantitative unit to NISP. A diagnostic zone is an easily recognizable part of a skeletal element that is shared by all species under consideration. Therefore antlers and horn cores would be a good example of elements that do not have diagnostic zones.

The diagnostic zone method tackles the interdependence problem of NISP by ensuring that is impossible to count the same bone more than once across a diagnostic zone. A zone is therefore only counted when more than 50% of that region is present (Watson 1979: 129).

Diagnostic zones encompass recognizable regions of bones and include fusion planes and articular surfaces. Long bones are separated into proximal and distal zones, and can be further separated into right and left if needed by querying the database.With a well-stocked reference collection, a good analyst may be able to add recognizable regions of long bone shafts, such as nutrient foramina, to the list of countable diagnostic zones (Dobney and Reilly 1988: 80). Slight adjustments were made following Bogucki (1982), mostly to account for the varying numbers of phalanges in different taxa. Taking equids as the standard (each phalanx=1 DZ, because there is one per foot, artiodactylphalanges are recorded as 0.5 DZ (two per foot), and carnivores such as dogs are given 0.2 DZ (5 per foot). Table 4.6 provides a list of the diagnostic zone criteria used in this study.

To deal with the problems of aggregation and the non-additive nature of traditional MNI counts, an anlyst using DZs could simply read off the number of zones directly from the database. Because zones are now being counted and not individual animals, adding across contexts is not a problem. Using DZs in this manner is essentially a minimum number of elements (MNE) calculations. MNE is often used in zooarchaeological studies but can mean different things and be calculated in different ways (Lyman 1994: 45). In order to avoid confusion, I simply use the term diagnostic zone (DZ).Although calculating MNE in this manner still retains some of the problems with minimum number estimates, its utility far outweighs the drawbacks (Orton 2008: 56).

One such problem, frequently encountered at Sarnevo, is that calculating frequencies using this method tends to severely reduce the sample size of identifiable fragments, and in highly fragmented assemblages, where the number of complete DZs is already low, this can lead to problems with quantification later on.

.

As a final note, where specimens belonging to a certain taxon are frequent enough (e.g. domestic cattle and fallow deer), relative abundances are expressed as a percentage of expected DZs if entire carcasses were present at the site. This procedure is roughly analogous to Binford's %MAU (Binford 1984, cited in Lyman 1994: 42) and is useful in helping to determine if certain body part are over or underrepresented due to taphonomic factors or differential transport and selection.

Table 4. 6. Diagnostic zone criteria following Watson 1979.

Element	Diagnostic Zone	Criteria
Maxilla	Alveolus, p3/P4	
Mandible	Alveolus, p3/P4	
Atlas		Whole bone
Axis	Dens	Whole bone
Sacrum	Cranial end	Articular surface
Scapula	Glenoid (distal end)	Articular surface
Humerus, proximal	Caput	Fusion plane of shaft
Humerus, Distal	Trochlea	Fusion plane of shaft
Radius, proximal		Fusion plane of shaft
Radius, distal		Fusion plane of shaft
Ulna, proximal		Articular surface
Radial carpal		Whole Bone
Intermediate carpal		Whole Bone
Ulnar carpal		Whole Bone
Second+third carpal		Whole Bone
Fourth carpal		Whole Bone
Metacarpal, proximal	MC III for non-ruminants	Articular surface
Metacarpal, distal	MC III for non-ruminants	Fusion plane of shaft
Pelvis	Ilium at acetabulum	Fusion plane
Femur, proximal	Caput	Fusion plane of shaft
Femur, distal		Fusion plane of shaft
Patella		Whole bone
Tibia, proximal		Fusion plane of shaft
Tibia, distal		Fusion plane of shaft
Malleolus/fibula, distal		Whole for malleolus, fusion plane of shaft for fibula
Astragalus		Whole bone
Calcaneus	Upper articulation	Articular surface
Naviculo-cuboid	4^{th} carpal only in taxa where separate	Whole bone
Metatarsal, proximal	MT III for non-ruminants	Articular surface
Metatarsal, distal	MT III for non-ruminants	Fusion plane of shaft

1st phalanx	Following method derived from Bogucki (1982)	Fusion plane of shaft
2nd phalanx	Same	Fusion plane of shaft
3rd phalanx	Same	Articular surface

4.4.4 Weight

Some analysts prefer to quantify taxa by summing the weight of fragments from particular taxa, what is known as the weight method (*wiegemethode)*. This tends to seriously overrepresent large-bodied taxa, but its proponents argue that its value lies in the realization that *relatively* speaking, percentage of live body weight to skeleton weight is similar among species as diverse as horse or rabbit (O'Connor 2000: 57). Casteel (1978) provides perhaps the best critique of the weight method.

While I do not feel that the weight method provides a very useful way of quantifying taxonomic abundances or even the amount of meat potentially consumed at a site, the specimen weight for each of the taxa at Sarnevo can be easily calculated from the database for future reference.

4.5 Cull patterns

4.5.1 Sex

Determining cull patterns based on sex was extremely difficult at Sarnevo due to the highly fragmented remains. For many species, such as bovids, there are a number of ways to determine sex anatomically. The morphology of the innominate is often distinctive enough to determine male or female in sheep, goats, and cattle (Boessneck, et al 1964; Greenfield 2006), but usually only if certain parts (prozimal pubis and ilium) are present. Horn core shape and size is another way that analysts usually distinguish between male and female bovids, but again, such elements are rare on archaeological sites. In some species, such as pigs, tooth morphology is another way to differentiate between the sexes. Most male cervids can be distinguished from females if there is antler attached to the frontal bone or if the pedicle is present.An additional problem with antler fragments is that it is usually impossible to tell if they were taken off an individual after death or recovered after being shed.

In the absence of strong morphological criteria, metrical analysis is often the next best way to indentify sex among a population of animals. Of course, this only holds true if the species is dimorphic enough to exhibit measurable size differences. Fortunately, most of the mammals considered in this study—cattle, caprines, and cervids—are dimorphic enough that a metrical analysis might be able to elucidate a cull pattern based on sex. However, as will be shown in the next section, sometimes too few measurable specimens were recovered to produce a reliable profile.

One final consideration of metrical analyses is that if a wild and domestic population are present together, as is the case here for cattle, it may be difficult to determine if any bimodality in measurements is due to sex differences or differences between a wild and domestic population. This problem will be discussed in the next section as it arises.

Measurements were taken on all specimens where possible. For the most part these measurements followed von den Driesch (1976), although in some cases the additional measurements used in the coding system at Çatalhöyük were also recorded, in order to produce a more comprehensive set of measurements. Where this is the case the references will be stated.

All measurements were taken with digital calipers and measured to the nearest tenth of a millimeter. A measuring box was not available at the time of analysis. Young or unfused specimens were measured, but were not included in metrical analyses in this thesis.

4.5.2 Age

Determining the age at death of a given population of animals is never straightforward in archaeology. Age estimates were given at the time of analysis on mandibular tooth eruption and wear and postcranial epiphyseal fusion. In the former case, the specimens are assigned wear stages following either Grant (1982) (pigs, cattle) or Payne (1973) (caprines). The eruption and wear of the teeth of wild species is less well understood than for domestic animals, although some studies have been aimed at wild populations (e.g. Zeder 2006). For wild animals teeth were classified into broader categories: *unworn/erupting, slight wear, moderate wear, heavy wear*.

Epiphyseal fusion is a less precise method of ageing specimens, for a number of reasons. First, only domestic animals have been studied in any detail (e.g. Silver 1969), Additionally, epiphyseal fusion rates are not constant and can vary even within the same individual, making a precise determination of age very difficult (O'Connor 2000: 96). For postcranial elements, specimens were assigned to age classes following Silver's (1969) published fusion ranges. Again, for wild animals there are few reliable systematic studies of postcranial fusion. Postcranial elements for deer were grouped into three categories: *fused*, *unfused,* and *epiphyseal line*.

In all cases, it was necessary to combine fusion data with mandibular wear. Though tooth wear is a more reliable way of ageing animals, given the problems discussed above with epiphyseal data, in the absence of a large sample it is useful to combine both types of data in order to compile age profiles.

5. Report on fauna from Neolithic features at Sarnevo

The following section is the overall faunal report for the site of Sarnevo, Stara Zagora District, Bulgaria. I begin with some general observations about the fauna recovered from these contexts and proceed to taxon by taxon discussion of recovered remains. In the next section I look at the breakdown of faunal remains by feature, in an attempt to identify any patterning in the deposition of faunal remains which might lend insight into patterns of communal consumption during the Late Neolithic.

Only the major "food mammals" were analyzed as part of this study. This includes cattle, both wild and domestic, deer, pigs, and sheep and goats. Equids are absent from the pits at Sarnevo. Other mammals, such as dogs and hares, are not included in this category of mammals, but are treated separately at the end of this section. This is not to suggest that these animals were not consumed. Though evidence for consumption in the form of burning or cut marks is absent from the remains of dogs or hares, more than likely they were eaten. Clearly, however, they were not consumed with the same frequency and intensity as the major food mammals, and therefore keeping them separate seems a prudent choice. Birds, mollusks, and microfauna (rodentia, for example) were excluded. These remains were quantified and set aside for future analysis (Table 5.1).

5.1 Wild and domestic taxa

Sarnevo shows a relatively high wild: domestic ratio. Karastoyanova (2011:102) reported that for Feature 9 the breakdown between wild species and domestic was very even, and that wild animals actually outranked domestic ones by NISP (52% wild to 48% domestic). For the features analyzed in this thesis, the domestic-wild breakdown is closer to 70% to 30% if calculated only by NISP, but by DZ is closer to 60% to 40%.

Table 5. 1. Taxonomic abundances at Sarnevo. Does not include undiagnostic fragments.

	Pit			Non pit	
Taxon	**NISP**	**DZ**		**NISP**	**DZ**
Bos taurus	720	309		271	117
Ovis	185	116		113	45
Capra	30	15		1	0
Ovis/Capra	275	71.5		76	11.5
Sus scrofa	168	67.5		63	23
Canis familiaris	28	17		9	4
Dama dama	448	257.5		174	81
Cervus elaphus	137	83.5		23	7
Bos primigenius	38	23		6	6
Capreolus capreolus	27	17.5		13	8
Lepus	5	5		0	0
Vulpes vulpes	1	1		0	0
Ovis/Capra/Capreolus	77	17		61	4
Bos/Bison	47	21		6	2.5
Small cervid	33	5		1	1
Large cervid	7	1		2	0
Indeterminate cervid	12	0		1	0
Lagomorpha	1	1		0	0
Large (cow-sized)	268	5		100	3
Medium (pig-sized)	148	3		69	7
Small (sheep-sized)	131	2		25	1
Hare-size (smaller than sheep/ small dog)	7	0		1	0
					0
Bird	46	0		18	0
Microfauna (smaller than rabbit)	11	0		1	0
Marine shell	58	0		9	0
Snail	10	0		0	0
Indeterminate	44	0		3	0
Total	2954	1039.5		1046	321

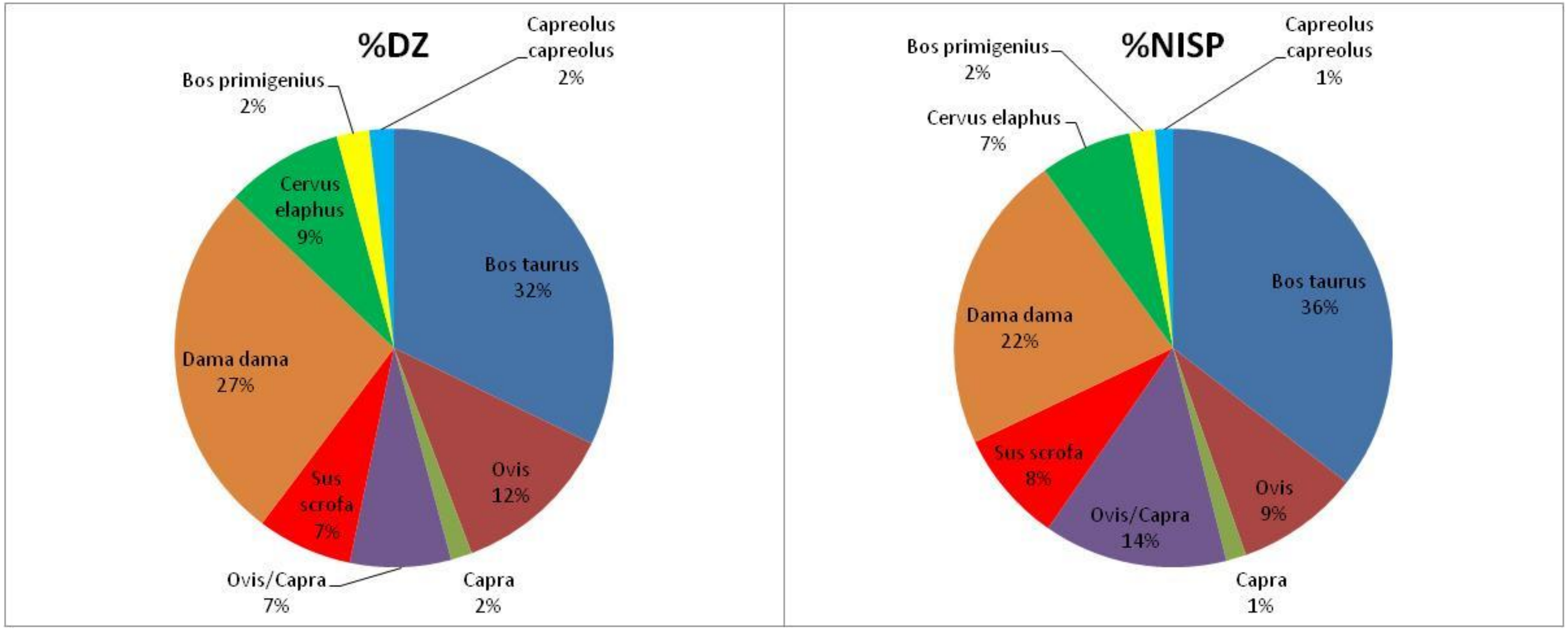

Figure 5. 1. Proportions of major food mammals from pit contexts.

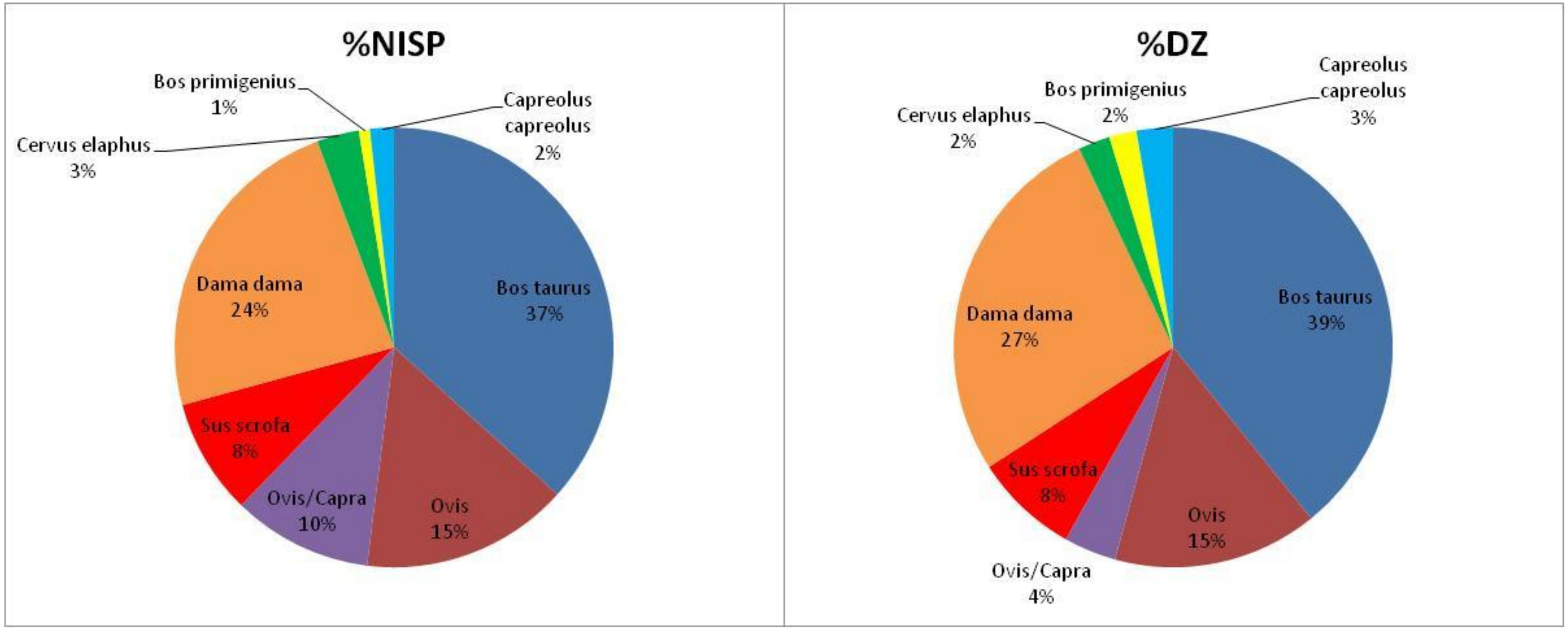

Figure 5. 2. Proportion of major food mammals for non-pit contexts.

There is no rule about the ratio of wild to domestic animals at Neolithic sites in Bulgaria or other parts of southeastern Europe. Conolly, et al (2011: 541) report that for the earliest Neolithic in SE Europe, domestic taxa are overwhelmingly more abundant than wild taxa. In comparing her data from Koprivets and Durankulak, Manhart found that at many sites in Bulgaria, domestic animals far outweighed their wild counterparts, but argued that hunting remained an important activity, especially in the Chalcolithic (Manhart 1998: 230-231). An exception to this pattern was Golyamo Delchevo, which retained a relatively high proportion of wild animals throughout the Chalcolithic (42.8, 47, amd 44.5% for the early, middle, and late Chalcolithic).

A list of wild and domestic taxa from numerous sites in Bulgaria and the Balkans shows that Sarnevo is not so unique in its high proportion of wild taxa, although it is worth noting that for the earliest Neolithic sites in Greece domestic animals are overwhelmingly abundant (Table 5.2). Table 5.2 shows that there is a great deal of variation through time and space in the proportions of wild and domestic taxa at Neolithic sites throughout the Balkans. Late Neolithic sites like Kalugerovo and Yasatepe have very few wild remains, while others, like Sarnevo and Durankulak, have many more. In short, the picture of wild and domestic animal use throughout the Neolithic and Chalcolithic in Southeastern Europe is highly contingent, a sentiment expressed earlier by Orton (2009).

Table 5. 2. Relative abundance of wild and domestic taxa from sites across Southeastern Europe. * Greek data from various analysts, reported in Wijnen, et al (1982:135)

Site	Period	Domestic	Wild	Method of calculation
Bulgaria				
Sarnevo	L. Neolithic	62.3 72.9	37.7 27.1	Diagnostic Zones (DZ) NISP
Kalugerovo	L. Neolithic	99.41	.59	NISP
Ovcharovo	Neolithic	69.1	30.9	Number of identified specimens (NISP)

G. Delchevo	Early Chalcolithic	57.2	42.8	NISP
Vinitsa	Chalcolithic	77.6	22.4	NISP
Ezero	L. Chalcolithic	85.2	14.8	NISP
Yasatepe	L. Neolithic	95.5	5.5	NISP
Durankulak (Manhart 1998)	L. Neolithic	69.5	30.5	Minimum number of individuals (MNI)
Koprivets (Manhart 1998)	Early Neolithic	91.1	8.9	MNI
	Late Neolithic	93.4	6.6	MNI
Serbia				
Gomolava (Orton 2008)	Mid-Late Neolithic	51.9	40.1	NISP
Petnica (Orton 2008)	Mid-Late Neolithic	40.6	51.7	NISP
Opovo (Russell 1993)	Mid-Late Neolithic	30.0	70.0	DZ
Divostin (Bokonyi 1988)	Middle-Late Neolithic	15	85	
Drenovac	Middle-Late Neolithic	29.3	71.7	
Greece				
Sesklo*	Early Neolithic	89.7	10.3	NISP
Nea Nikomedeia*	Early Neolithic	93.0	7.0	NISP
Argissa*	Early Neolithic	99.0	0.9	NISP

5.2 Cattle (*Bos sp.)*

Aurochs, *Bos primigenius*, are common in assemblages from Neolithic SE Europe. Domesticated cattle, *Bos taurus* are a mainstay of the Neolithic "package" in Europe, and indeed are present with the earliest farming communities in SE Europe. They are the single most abundant taxon at Sarnevo, and comprise nearly 90% of the *Bos* specimens identified (over 90% for non pits, Figure 5.4). Faunal analysts often have to deal with the remains of both wild and domestic forms in their investigations and Sarnevo was no different.

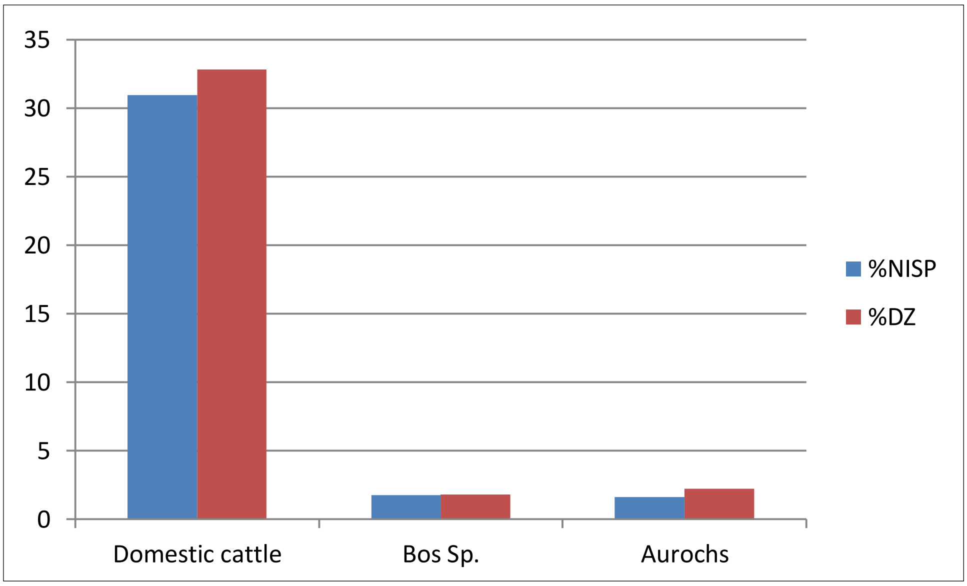

Figure 5. 3. Cattle remains as a percentage of the entire assemblage

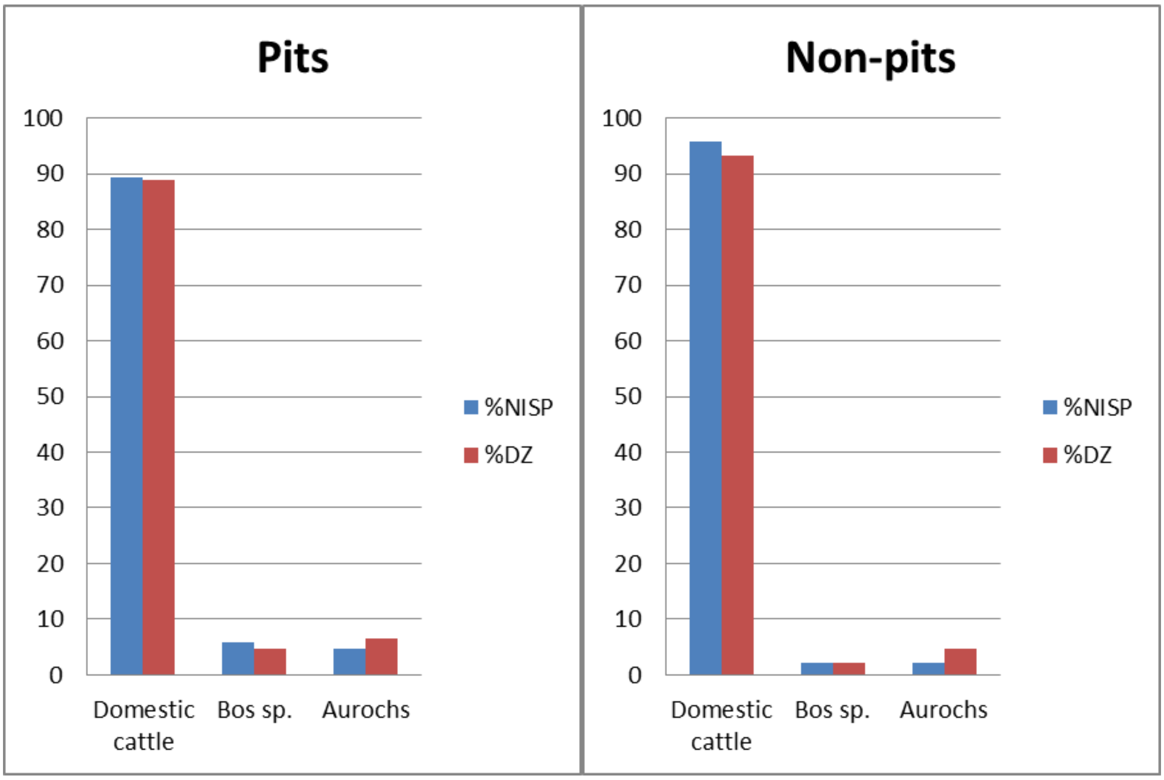

Figure 5. 4. Wild and domestic cattle remains from Sarnevo

As seen in figure (5.3), aurochs make up less than 3% of the entire assemblage. The vast majority of *Bos* remains were clearly domestic based on size alone. It is unclear how much interbreeding, if any, was taking place between SE European domestic and wild cattle populations. Recent genetic work on cattle points to two domestication "events" located outside of Europe (one for taurine cattle and another for zebu), and suggests that by the time of the first influx of cattle with herding populations into Europe, they were already in an advanced stage of domestication (hence their noticeably smaller size). However, while in some parts of Europe there seems to be little to no introgression of wild genes into domestic stock, in Southern Europe (Italy), Neolithic herders either tolerated or encouraged extensive breeding with extant populations of female aurochsen (Caramelli 2006: 118).

Size is still the most frequently used criterion for distinguishing between domestic and wild cattle in archaeofaunal assemblages, and usually results in a clear profile as shown here for Sarnevo. What's unclear is the degree of overlap between domestic males and wild females. If, as Caramelli's study suggests, there was introgression of aurochs DNA into Neolithic cattle populations, size differences between the two would become a much fuzzier issue.

Normally one could address this problem by comparing domestic remains to wild, in order to observe the degree of overlap, using a standard animal for comparison. In this case measurements from the Ullerslev cow, a female aurochs from Denmark, were used following Steppan's 1996 remeasurements. Northern European aurochsen are likely to have been much larger than domestic cattle, so that even the wild females should be larger than the domestic males (Grigson 1969: 288) Therefore measurements that fall below the Ullerslev cow are likely to all be domestic animals. If a mixed population of males and females is present, then we might expect to see a bimodal distribution of measurements.

In order to make the most of the measurements taken, they were ordered on a single scale using Meadow's (1981, but presented in Meadow 1999) Log size index (LSI, Figure 5.5). This method uses the differences of the logarithms (base 10) of the archaeological measurements and the standard animal and has the advantage that different dimensions from different elements can all be compared together in the same graphic. Measurements larger than the standard have positive values; those smaller have negative values (Meadow 1999: 288).

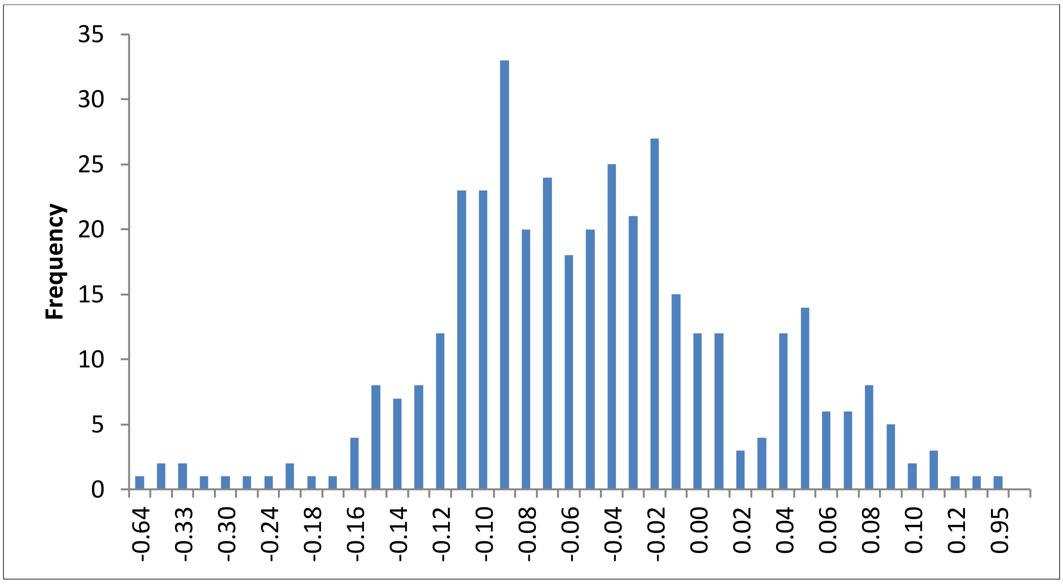

Figure 5. 5. Cattle standard animal values

Figure 5.5 shows that most of the *Bos* measurements fall below the size range for the Ullerslev cow. Since the Ullerslev specimen was a large cow, any measurements larger than the standard are moast likely those of male aurochsen. Below the standard is less straightforward: they most probably come from a mix of smaller females and domestic males.

If the measurements are separated and compared individually (Figure 5.6) the trend is again for *Bos* measurements to fall mostly below the standard animal, with some that are larger and probably from wild animals. The remainder of the unidentified specimens (those assigned to the *Bos sp.* category) is then most probably domestic. However, since so few of the remains were actually recorded as *Bos sp.*, it was not considered necessary to place them into the wild or domestic category. The LSI and the plot of individual measurements show that domestic cattle could be reliably determined at the time of coding based on size alone. Of course, the possibility of interbreeding between aurochsen and domestic stock is still possible, although probably was not a widespread practice.

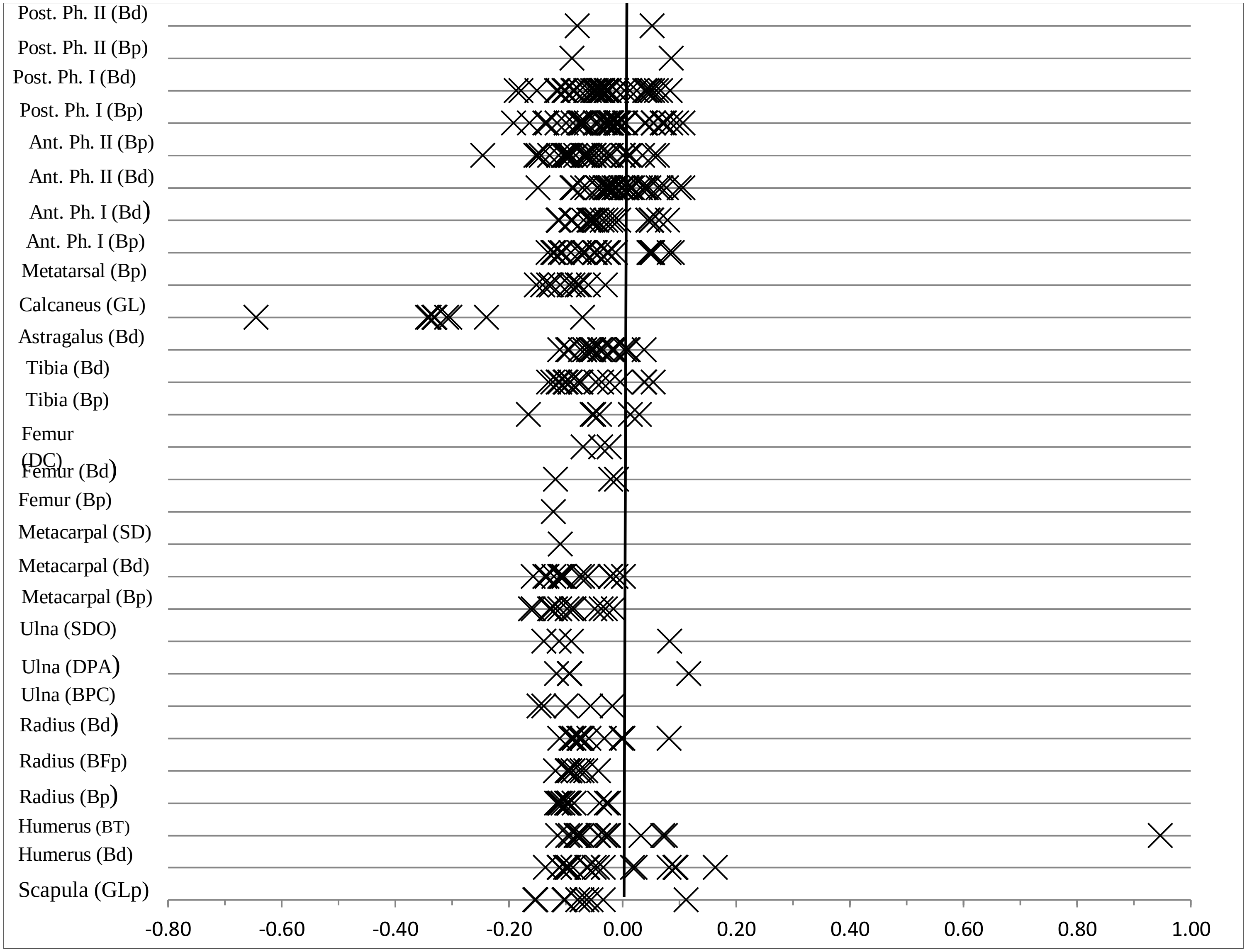

Figure 5. 6. Cattle measurements plotted individually

5.2.1 Domestic cattle (*Bos taurus*)

Domestic cattle make up the majority of identified specimens at Sarnevo. They are the most abundant individual taxon at the site, and contribute their remains to every single pit examined (see section 6 for a feature by feature discussion). Even still, they do not make up more than 40% of both the total site NISP or DZ.

Body part representation

Cattle body parts are presented in Figure 5.7 and 5.8, based on diagnostic zones At first glance it appears to be largely a density mediated patterning: the more robust elements of the lower parts of the hind leg, including the distal MT, tarsals (astragalus, calcaneus) and phalanges, especially the first phalanx, stand out. This effect is more pronounced for the pits as opposed to non-pits, but this may simply be a case of small sample size; compared to pits there were fewer recordable diagnostic zones in the non-pit contexts.

Karastoyanova's (2011: 87-89) results from Feature 9 show a higher occurrence of first and second phalanges and M3, a pattern to be expected if the same sorts of taphonomic agents working at the site were also a factor in Feature 9 . According to her analysis, elements from the head make up 25% of the identified remains and the lower parts of the feet make up 46% (NISP). This led her to calculate that 44% of the assemblage was from those elements with little to no meat.

Perhaps a better way to express body parts is as a percentage of the total number of diagnostic zones one would expect if whole carcasses were present at the site. This has the advantage of ‘norming’ the distribution of body parts and can help eliminate bias towards some of the more abundant elements in the body (phalanges). Figures 5.9 and 5.10 present cattle body parts as a percentage of the total expected DZs, calculated based on the distal metacarpal, the most abundant element. Now the fore and hind limbs are better represented in comparison with the phalanges. Density mediated attrition is still clearly an issue, as the less dense parts of elements such as the humerus or tibia are still largely absent. The non-pits show roughly the same pattern, although elements from the upper limb are far less frequent.

The body part profiles for cattle seem to indicate a focus on the meaty upper limbs, but on the lower limbs as well. Although there is no meat on the lower limb elements, there is marrow for extraction in the cavities of the metapodials. When combined with the data for undiagnostic fragments for cattle sized animals (most of which must have belonged to domestic cattle) rib and vertebrae scrap are well represented (see below, *Undiagnostic specimens)*. All of this argues against a “Schlepp Effect” (Perkins and Daly 1968), where certain parts of the carcass are carried on site while others are left elsewhere. This has interesting implications if the animal remains were carried off a nearby settlement and brought to Sarnevo, as has been suggested elsewhere (section 1).

It’s a good possibility, then, that cattle were slaughtered on site at Sarnevo. This fits well with the recognition that in prehistory, as in the modern era, domestic animals are probably sacrificed during feasts and indeed their deaths are part of the theatricality of feasting (Hamilakis 2008; Russell 2012b; see section 3).

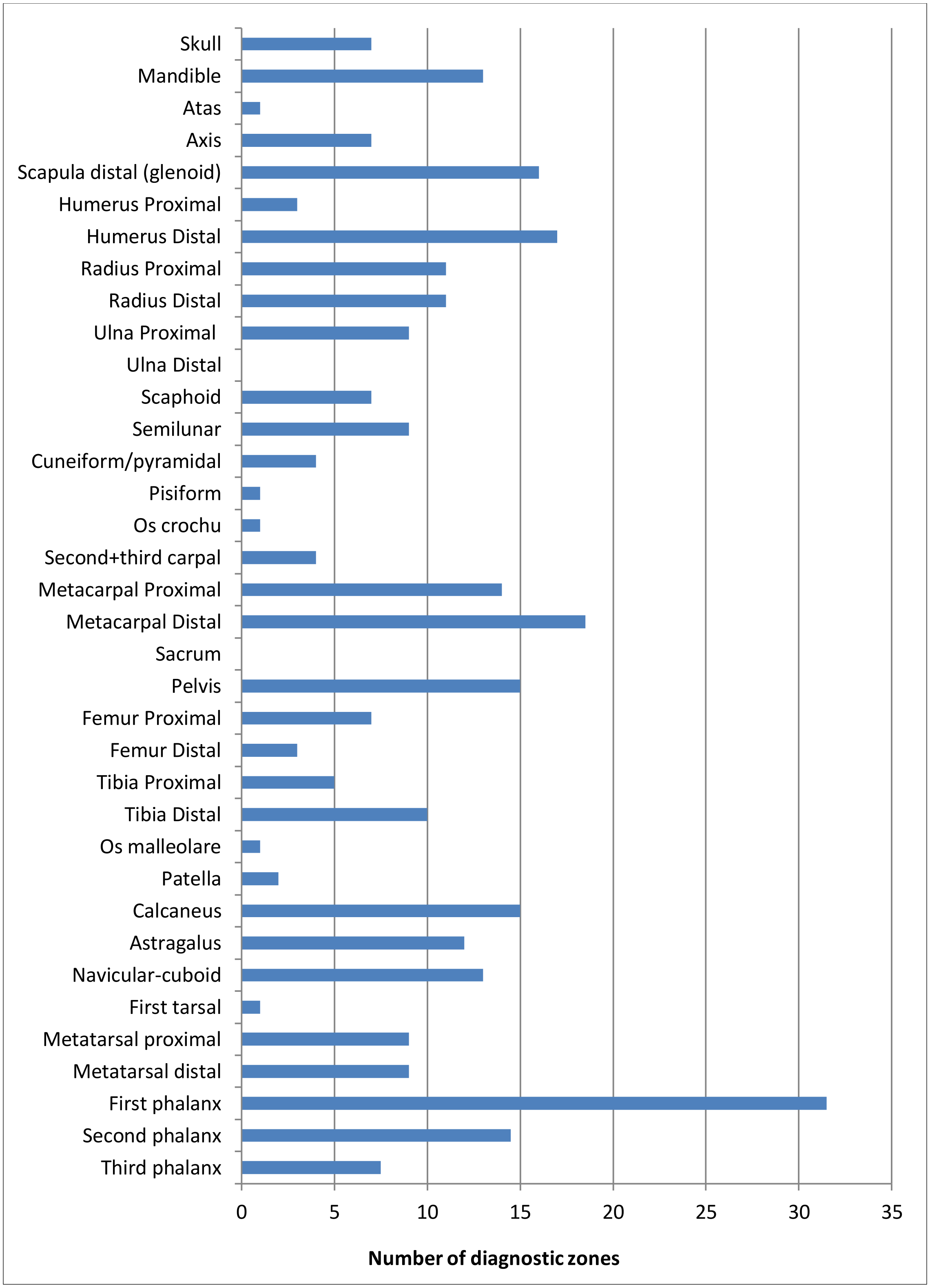

Figure 5. 7. Cattle Body parts for pit features: number of diagnostic zones

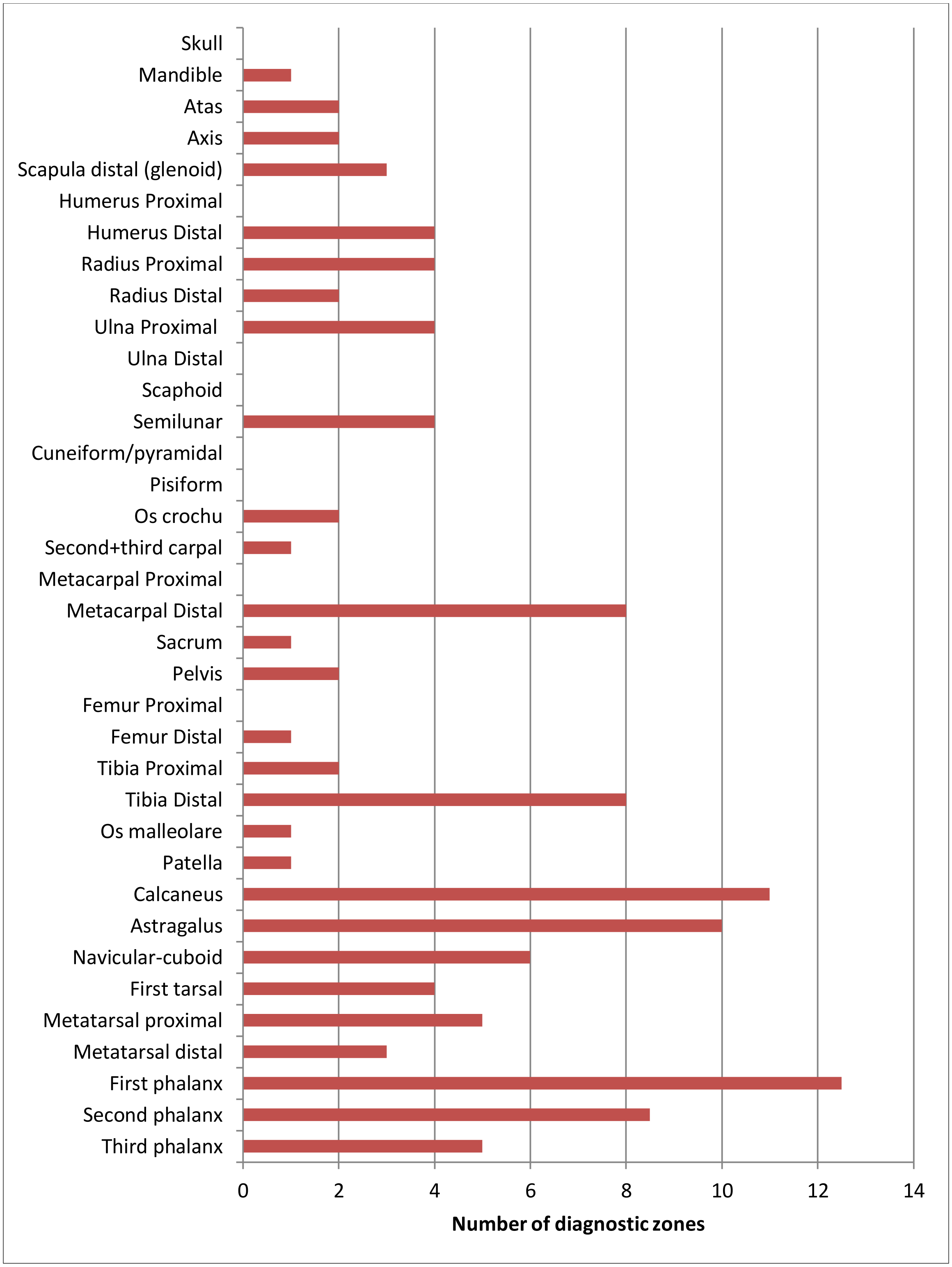

Figure 5. 8. Cattle body parts for non-pit contexts: number of diagnostic zones

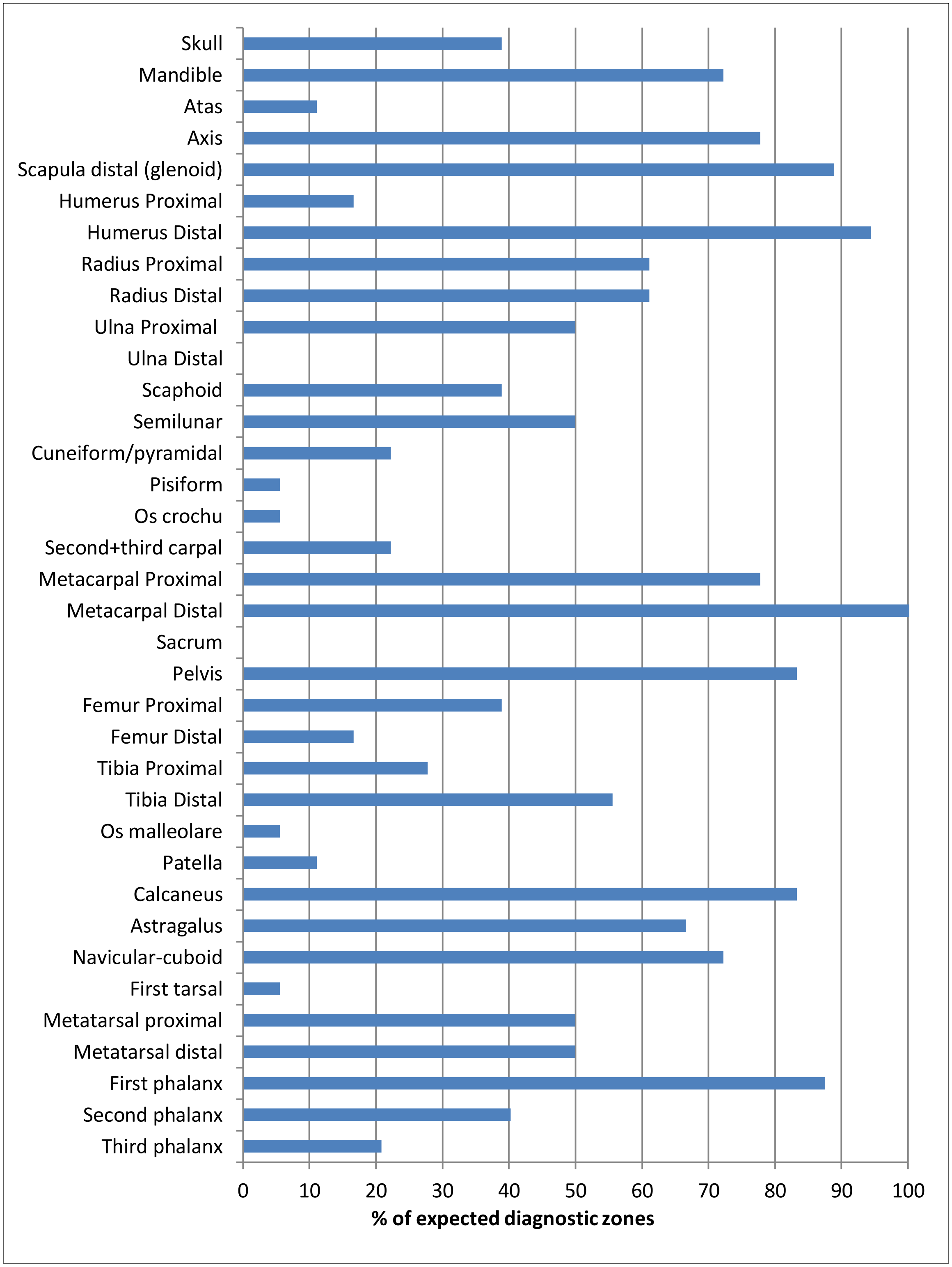

Figure 5. 9. Cattle body parts for pit features: % of expected DZs

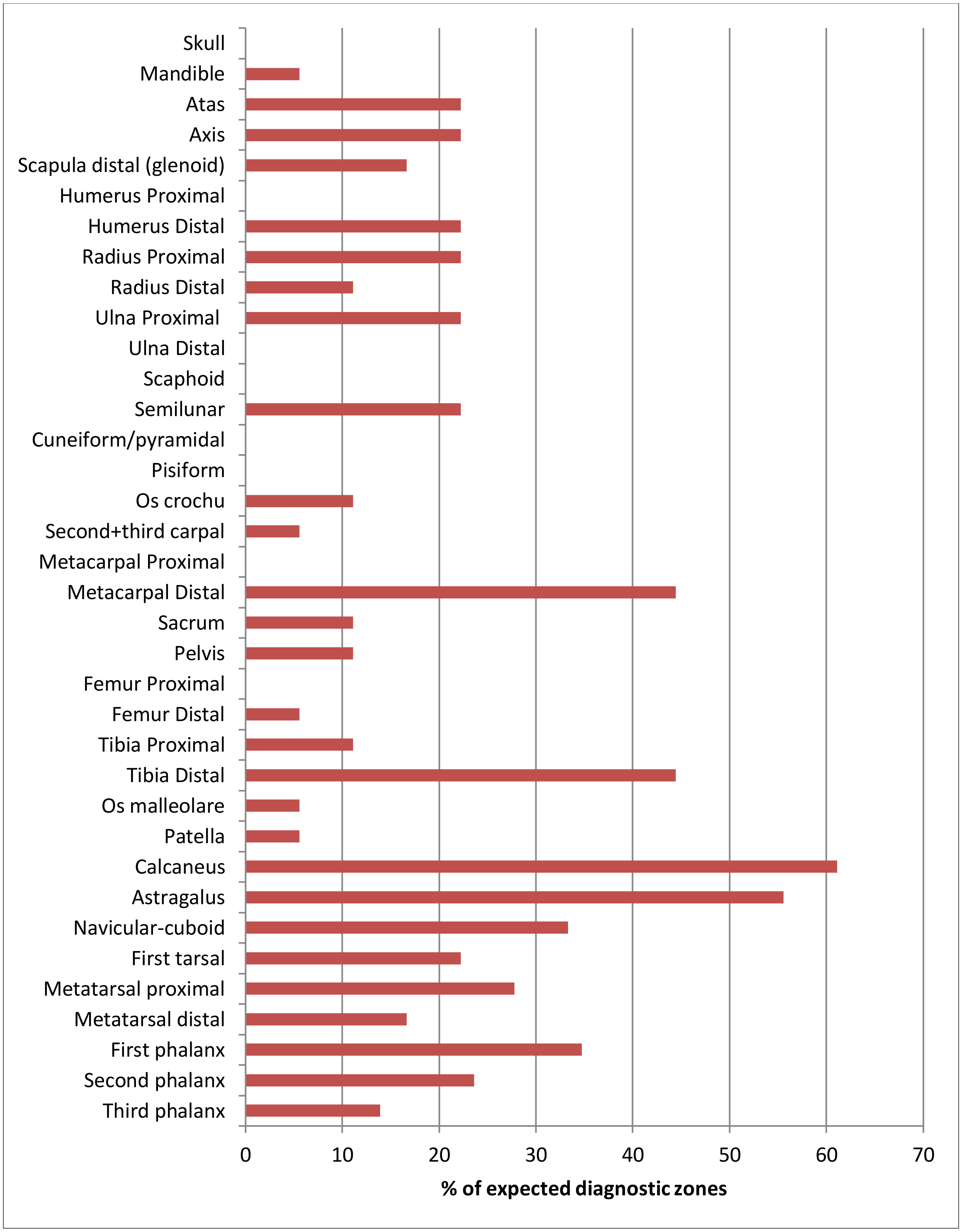

Figure 5. 10. Cattle body parts for non-pit contexts: % of expected diagnostic zones

Cull patterns

Age

Far too few cattle mandible were sufficiently intact to examine cull patterns following Grant's (1982) eruption and wear scheme. This required several cheek teeth to be present and therefore resulted in very few mandibles being assigned a relative age category. 119 postcranial specimens (69 DZ) could be reliably assigned an age class.

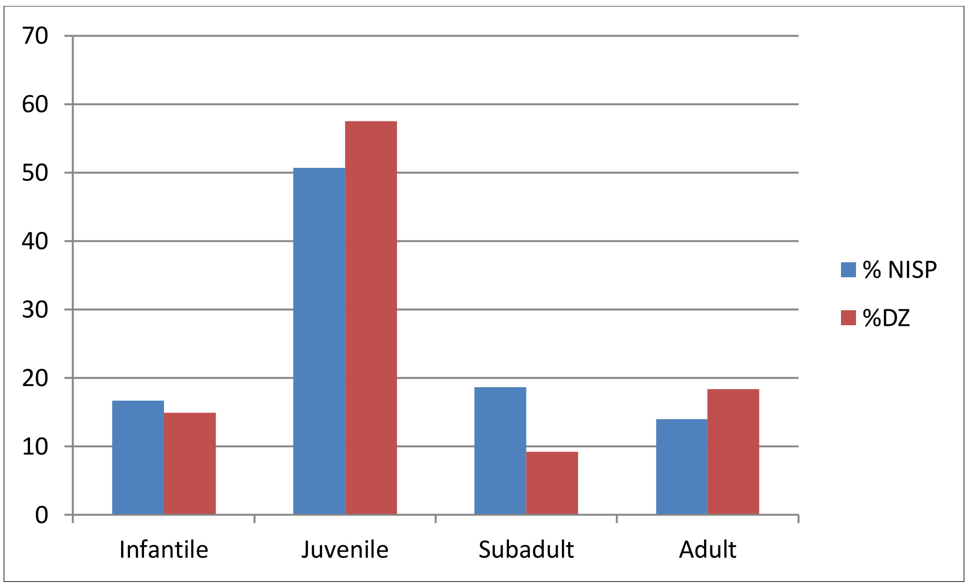

Figure 5. 11. Cattle age classes for postcranial elements

Juveniles are far more abundant than any other age class (Figure 5.11). A similar situation was reported by Karastoyanova (2011: 89) for Feature 9, where 41% of the identified cattle specimens belonged to juvenile individuals. If the concern is to provide as much meat as possible (for sharing during commensal events), then a high proportion of juveniles might be expected, as growth slows and feeding results in little additional weight gain (Russell 2004: 325). But the presence of other age classes shows that while juveniles may have been especially earmarked for widespread consumption, animals could be slaughtered at various stages in their lives. This is most likely a reflection of a herding strategy that attempts to take into account the various roles of livestock, as producers of dairy, commodities for exchange, etc.

Sex

Morphologically sexable specimens were rare at Sarnevo, thanks to the high degree of fragmentation. In cattle, sexable features are few in number and are limited mostly to horn cores and the morphological features of the innominate described in Section 4.

Biometrical analysis may be more useful. Even after domestication, cattle exhibit a degree of sexual dimorphism, and some elements, like the metacarpal, have been argued to reflect this difference (Bartosiewicz 1987, cited in Russell and Martin 2005: 51). Additionally, since the vast majority of the *Bos* remains recovered from Sarnevo belong to domestic cattle, any bimodality in measurements is most likely of the result of sexual dimorphism and not separate wild and domestic populations. However it is important to point out that biometrical analysis is not intended to be a way of definitively assigning sex to individual specimens, but only to suggest the presence or absence of a male and female population (Russell and Martin 2005: 51). A number of elements provided enough measurements to investigate size differences. I have added Karastoyanova's published measurements to my own.

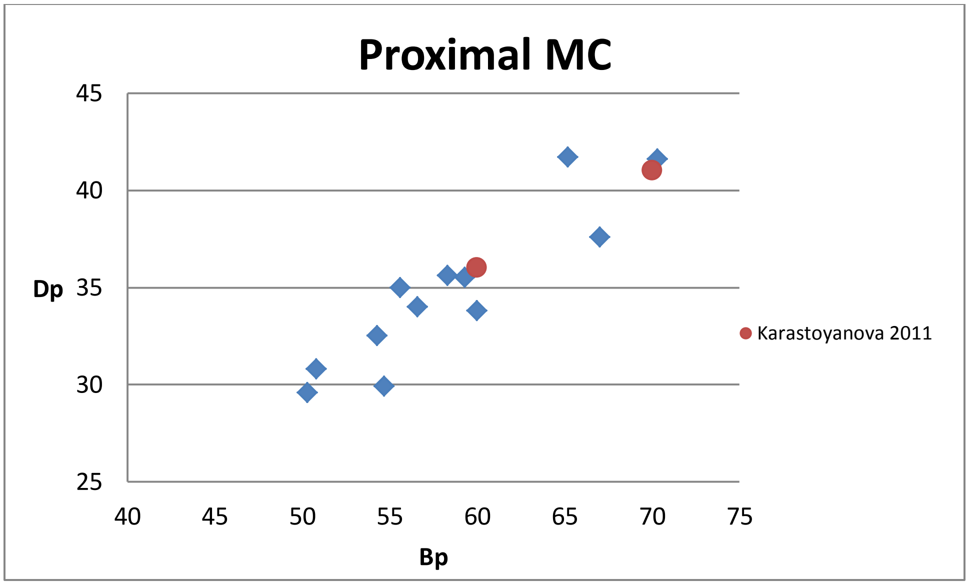

Figure 5. 12. Cattle measurements

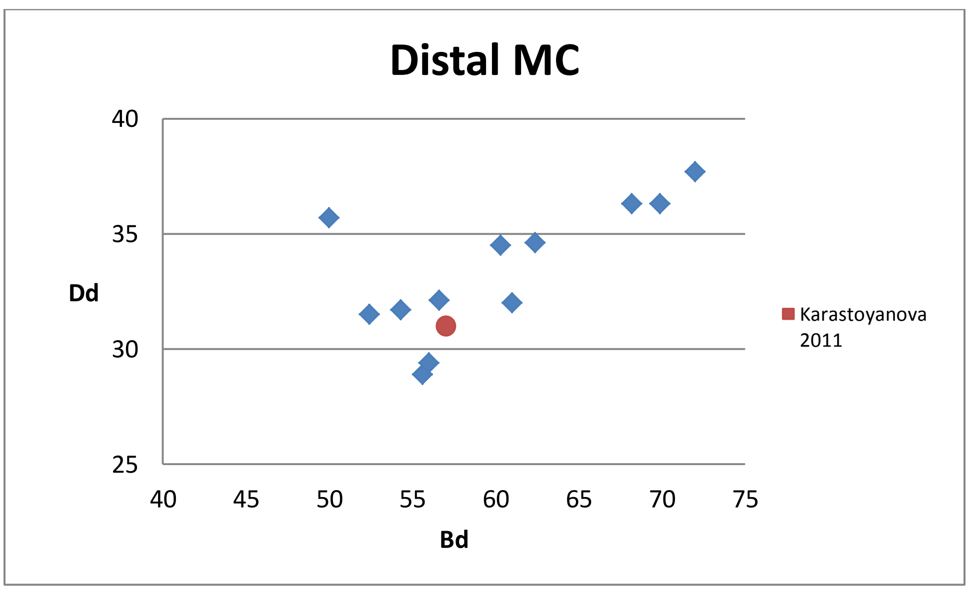

Figure 5. 13. Cattle measurements

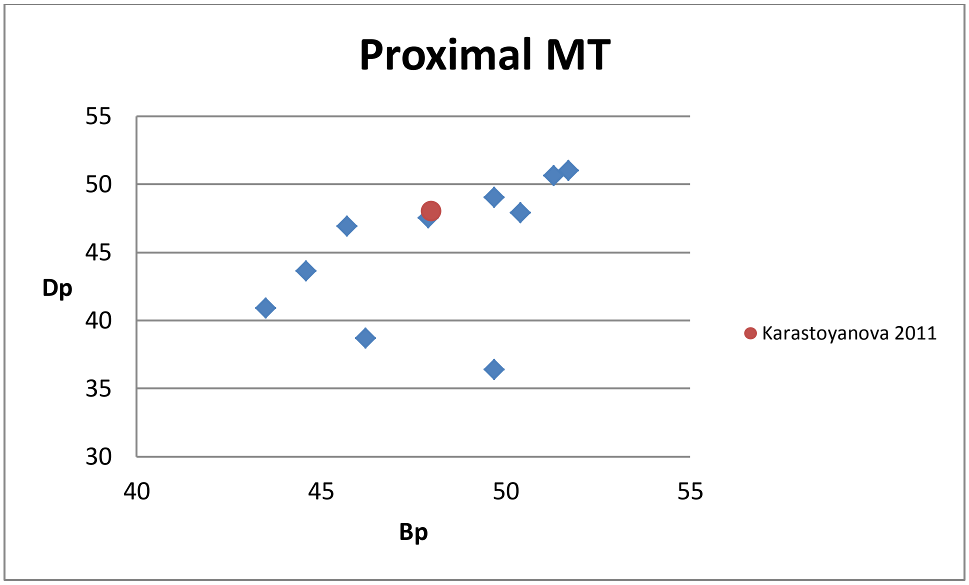

Figure 5. 14. Cattle measurements

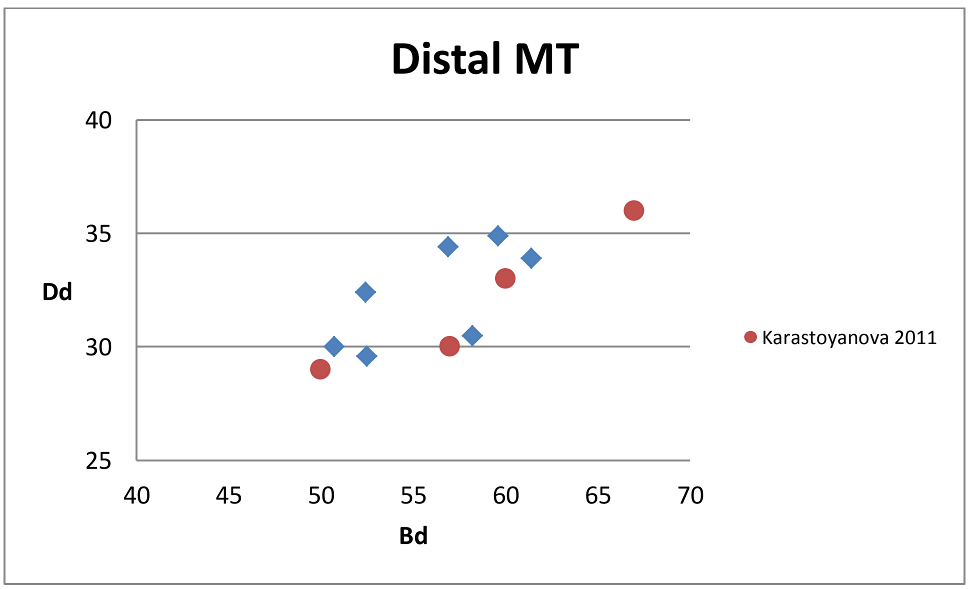

Figure 5. 15. Cattle measurements

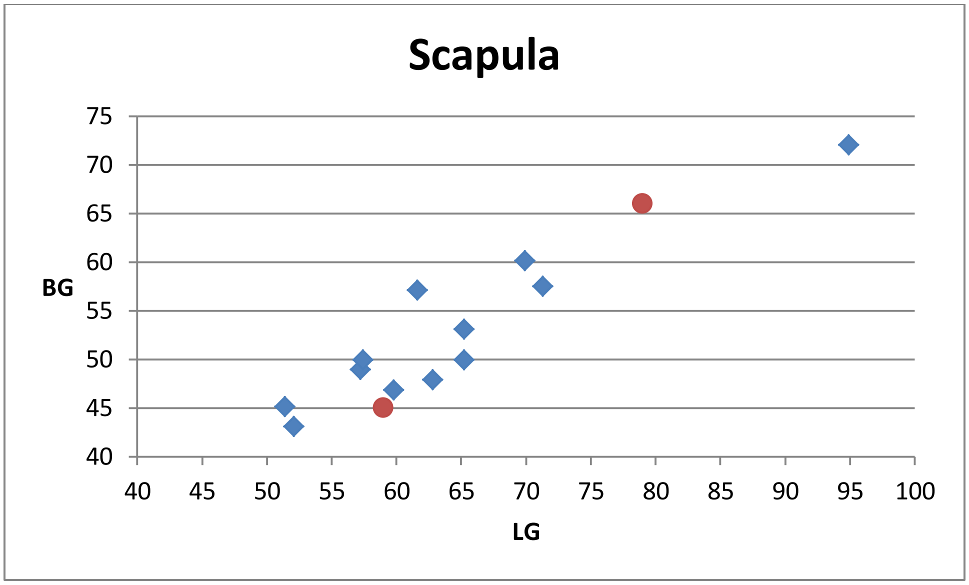

Figure 5. 16. Cattle measurements

Proximal and Distal MC measurements sort into a larger and a smaller group, with a third group of a few measurements that overlap slightly (Figures5.12-5.13). Distal MT measurements seem to cluster better than the proximal ones. Scapulae seem to have a less clear distribution. In the cases where there seems to be a clearer distribution of measurements (MC, MT, and maybe scapula), there are more measurements which fall in the smaller range, perhaps suggesting more females.

Though there does seem to be a mixed population of cattle at the site, the exact ratio cannot be determined. At this point, a tentative conclusion might be that Neolithic herders managed their flocks in ways that attempted to provide for numerous needs, from dairy to live animals for exchange to meat for feasts. Therefore a mixed population of males and females is to be expected. It may be that the majority of the juvenile animals that are slaughtered are males, since presumably females would be more valuable as reproducers of the herd.

Horn cores and cranial specimens

There were three specimens that deserve special comment. These are portions of cattle frontal bones with attached horn cores. They are important because they present evidence for the type of cattle (longhorn) present at Sarnevo in the Later Neolithic. It is sometimes possible to age and sex cattle horn cores. When complete, horn core morphology can help to distincguish between bull, cow, and ox (castrate) (Clutton-Brock and Armitage 1976; Armitage 1982). No horn cores were completely preserved at Sarnevo, although 62.5.1 was complete enough to estimate its length. In the absecnce of complete specimens, the basal circumference of the horncore can be used to determine sex (Grigson 1982). Unfortunately this measurement was not taken during the analysis.

66.23.11—this specimen was heavily fragmented by modern breaks, which were mostly refit. The right side of the frontal bone is present as is a good portion of the right horn core. While the entire core isn't complete, its preserved length is clearly greater than 360 mm, which is the cutoff for longhorn cattle according to Armitage (1982: 43). On the frontal bone at the base of the horn core there are 7 very light cut marks, on top of which are 4-5 other light cut marks which run in the opposite direction. Most likely these marks are related to skinning the specimen or removing the keratinous sheath prior to deposition.

62.1.28—this specimen is from the left side of the frontal bone and the beginnings of the horn core; only about 25% of the core is complete. Based on preserved diameter and the very porous nature of the horn core, this must belong to a young (juvenile) individual. Not enough of the core was complete to sex this specimen.

62.5.1—this specimen is a partial left horn core with less than 2/3 of the frontal bone attached. At the time of coding, this specimen was considered to possibly belong to a small aurochs, however, the preserved length (again, visibly more than 360 mm) of the core and its morphology are very similar to what Armitage describes as “unimproved longhorn bull “(1982: 48).

Discussion: Cattle

Both wild and domestic cattle are present at Sarnevo, although remains from the former are far less abundant. The most important difference between the two species is their relationships with humans. Wild cattle are large and dangerous animals to hunt. Though they may have been encountered only occasionally, killing them would almost certainly have required a group effort, and could speak to a level of cooperation and organization beyond a single household (Orton 2009: 13). Killing them may have provided an occasion for feasting, or hunting parties may have been organized in advance of the feast to include this formidable animal in the festivities.

Domestic cattle represent quite a different set of social values. As discussed in section 2, they are distinct from their wild counterparts in that they are a sort of movable property while still alive, and during their lives can embody human social relationships. Slow growing, slow reproducing, and “expensive” animals, cattle were highly prized in Neolithic society, and herding strategies most likely attempted to accommodate a wide range of needs.

The role of cattle and their secondary products in social transformations in Neolithic and Bronze Age Europe has been discussed elsewhere (Pullen 1992; Bogucki 1993, 2011), and from these arguments their value as feasting commodities becomes clear. If cattle are one of the primary means by which pre-market, pre-metal groups can accrue “wealth”, then sacrificing that wealth through competitive consumption may serve to underscore the prestige of the owner, through ostentatious wealth destruction or the creation of obligations to reciprocate, perhaps with "interest". As seen in section 3, this form of competition is quite common even where a more community oriented ethos may be present. The cattle at Sarnevo are not so overwhelmingly abundant as to suggest that they were the only proper feasting food, but clearly they played a central role in communal consumption during the Late Neolithic

5.3 Sheep/goat (*Ovis/Capra*)

Sheep and goat remains account for nearly 26% of the identifiable specimens for the major mammalian taxa and just over 20% when counted by DZ.

Unlike cattle, the issue of local domestication of sheep and goats in the Balkans is rarely raised due to general consensus that the wild ancestors of the species *O. orientalis* (sheep) and *C. aegagrus* (goat) went extinct in this part of the peninsula sometime during the end of the Pleistocene (Popov et al 2007: 40-41).

I agree with Arbuckle's (2009: 150) sentiment that combining sheep and goats into a sheep/goat or caprine category can mask differential management strategies for each species, and should be avoided if possible. Yet it was nevertheless necessary to do so here, because of high fragmentation and the limitations of the reference materials.

An attempt was made, however, to distinguish between sheep and goat wherever possible. This was done using the reference collection, which included a complete modern sheep from Bulgaria as well as several other incomplete specimens, both modern and archaeological, and a very limited goat collection. Where diagnostic points on bones were preserved, Prummel and Frisch (1986) was used to make the distinction. Mandibular teeth were assessed using Halstead et al.

(2002); however loose teeth and those of young individuals proved very difficult to assess using the criteria laid out by the authors and these were usually relegated to a sheep/goat category.

Finally, because of the highly fragmented nature of the collection, an additional category had to be employed: code “14”: *sheep/goat/roe deer* was used to record some elements which could not be distinguished beyond this basic category.

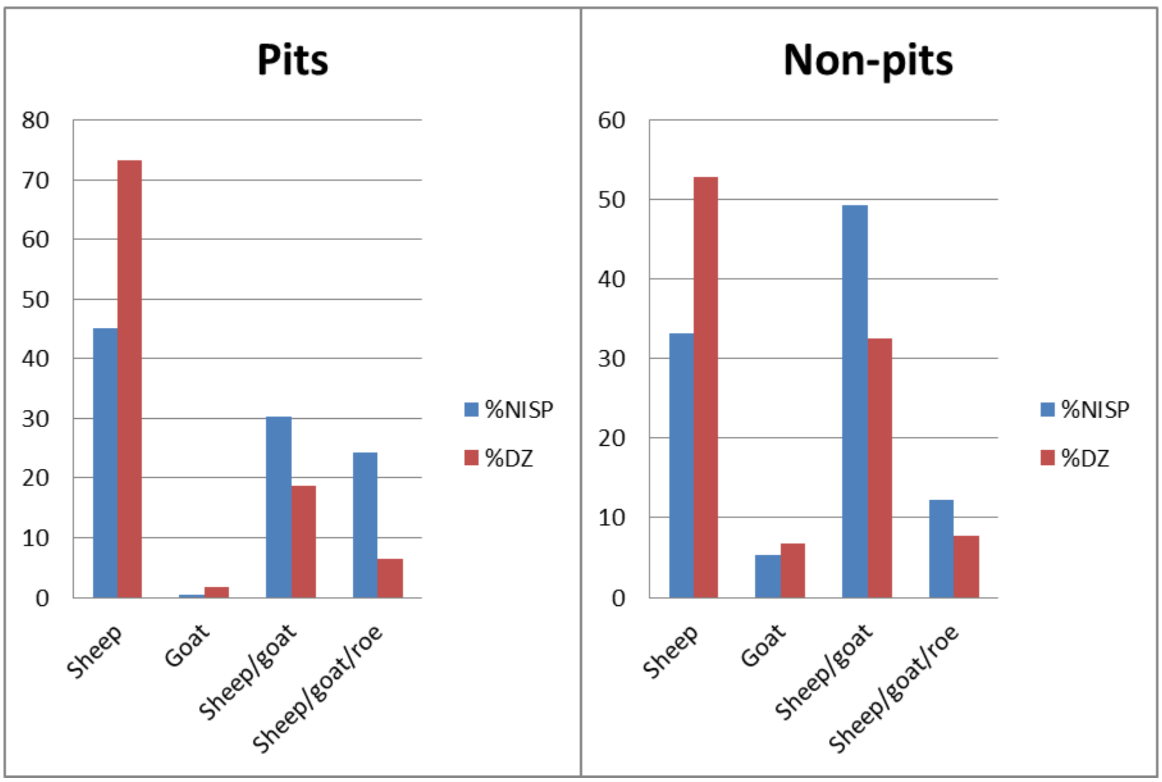

Figure 5. 17. Relative abundance of caprines by context.

When identifications could be made, most specimens belonged to sheep (Figure 5.17). They outnumber even the broader categories and certainly outnumber the goats by a great deal. For the body part analysis, all sheep, goat and sheep/goat remains will be combined into a single sheep/goat category in order to facilitate statistical analysis and provide a useful comparison between large and small-bodied species. Only sheep measurements are used in the calculation of the LSI, because the standard animal used for comparison was a sheep (see below).

Body Part representation

The body part profiles for caprines are different than those of cattle. The first difference is the lack of the most distal parts of the feet: the carpals, tarsals, and phalanges. As argued in section 4, this is due most likely to recovery bias. When the raw number of diagnostic zones are compared with the percent expected with complete carcasses, the profiles are nearly identical, for both pit and non-pit contexts (Figures 5.18-5.19).

The difference between the body part profiles for the pit features and the non-pit contexts is interesting. Limb elements, both fore and hind, appear to be more abundant in non-pit contexts than in pits. It is necessary to point out, however, that no element contributed more than ten diagnostic zones to the non-pit sample (Figure 5.20 and 5.21), and the seemingly high amount of limb bones may be a result of sample size. Forelimb elements are well represented in the pits, especially the distal scapula, distal humerus, and proximal radius, although these are denser parts of the skeleton.

In both contexts mandibles are overrepresented. In fact at the time of coding the number of mandibles relative to other sheep/goat body parts was very noticeable. Though they seem to have been deposited in pits with greater frequency, outside of the pits they still constitute 80% of expected diagnostic zones. Many of these mandibles showed brownish-black burning on the underside and sides of the horizontal ramus (see below, *Cooking*). This is a pattern commonly observed when the marrow that exists in the cavity of the mandible is roasted and then extracted. It is possible that sheep/goat mandibles were overvalued compared to the rest of the carcass, either because they provided tasty marrow for snacking or because mandibles had some sort of symbolic importance. As will be shown below, the pig mandibles show the same pattern.

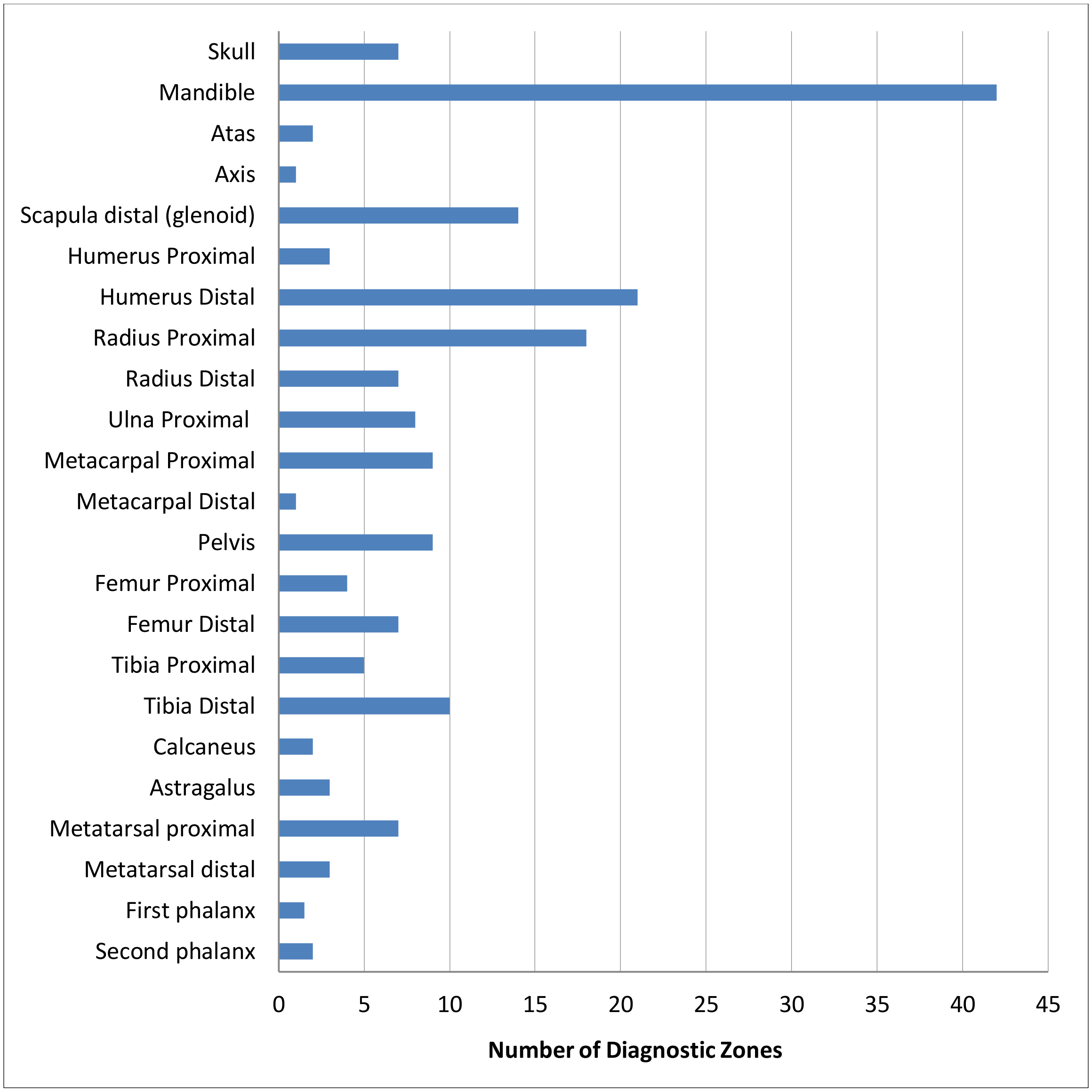

Figure 5. 18. Sheep/goat body parts for pit features: Number of DZs

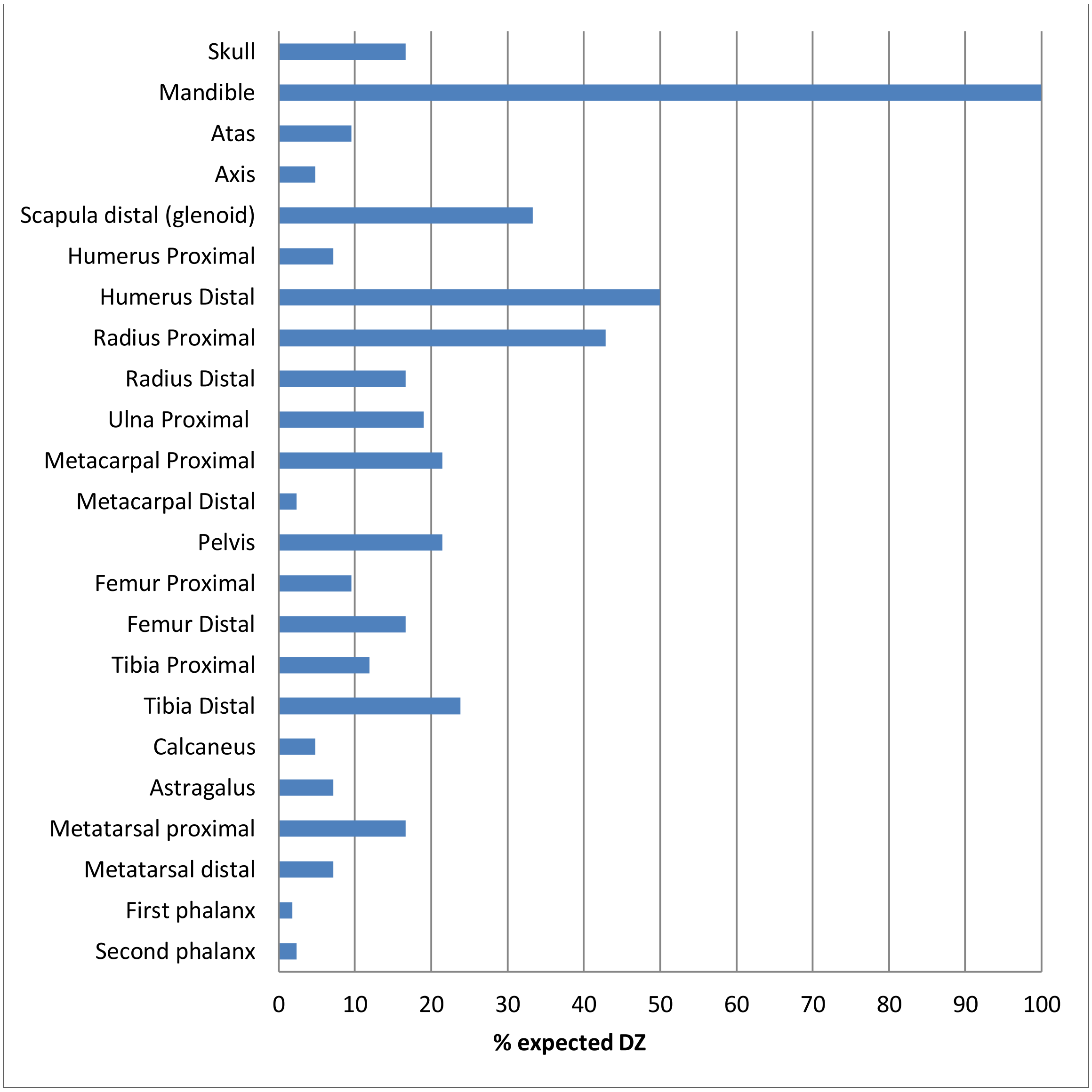

Figure 5. 19. Sheep/goat body parts for pit features: % of expected DZ

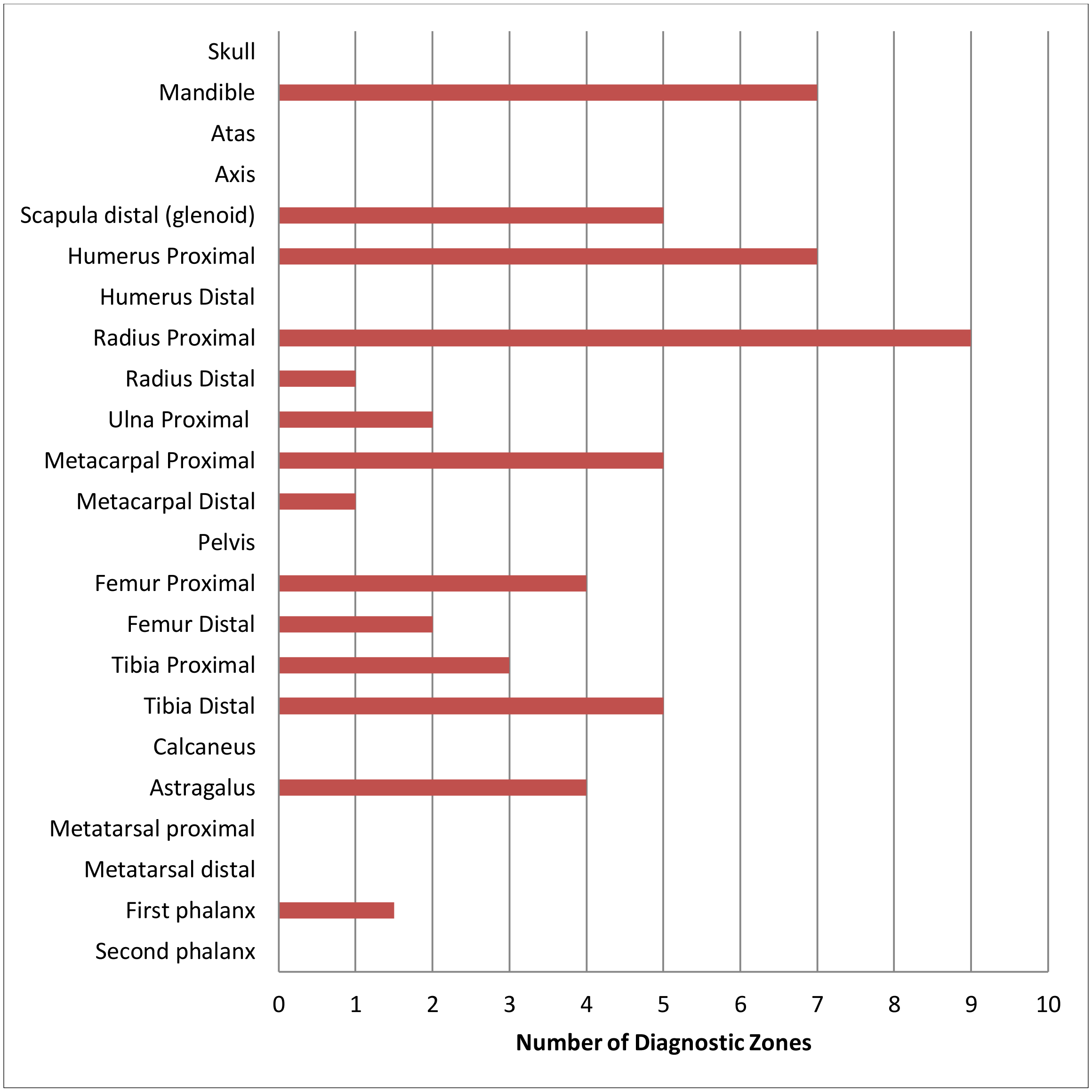

Figure 5. 20. Sheep/goat body parts for non-pit contexts: Number of DZs

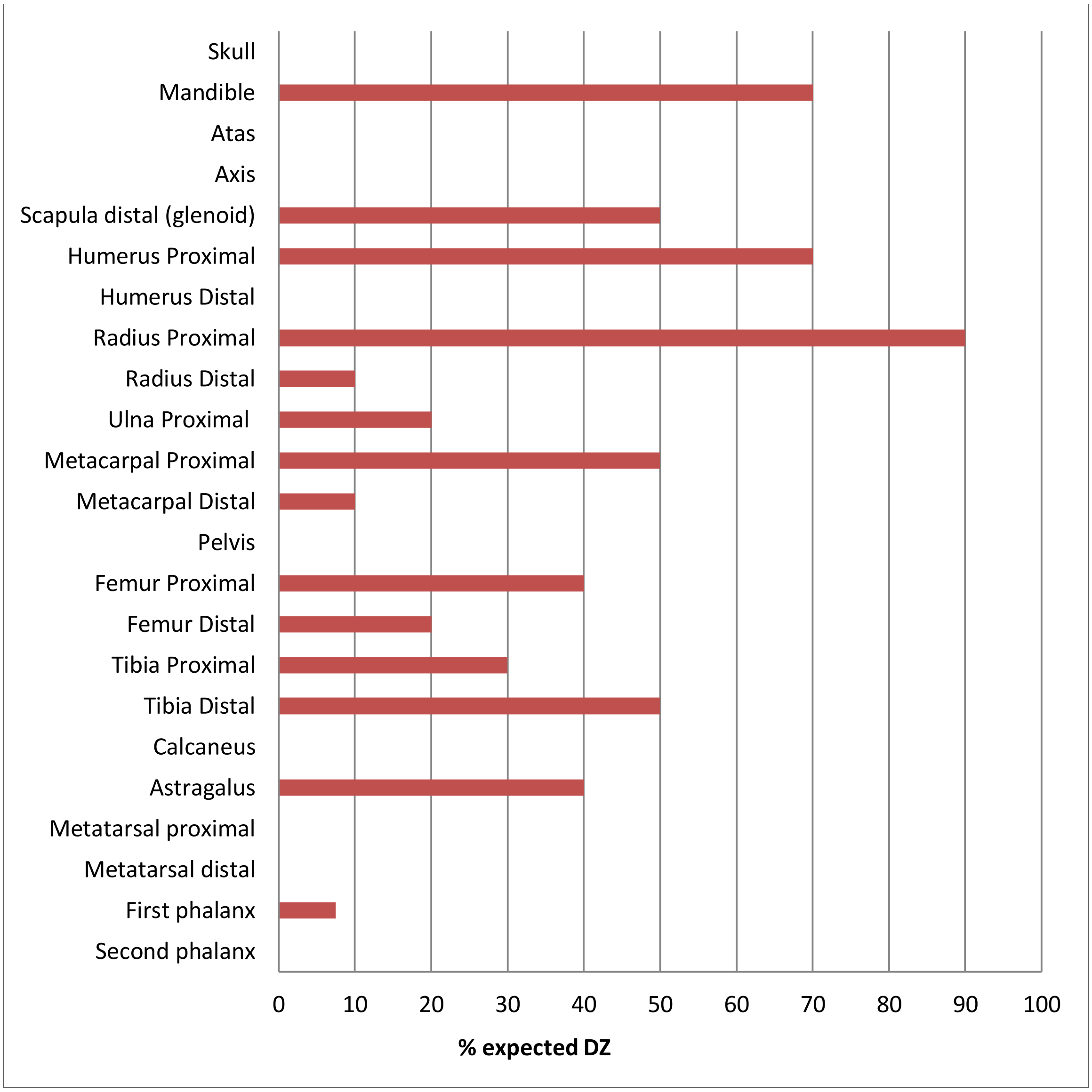

Figure 5. 21. Sheep/goat body parts for non-pit contexts: % expected DZs

Cull patterns

Age

The sheep/goat sample was large enough to combine mandibular wear with epiphyseal data to examine age-based cull patterns. When combining these methods there is always the danger of interdependence, but in the absence of very large samples of mandibles, it is still useful to use tooth wear and fusion stages in conjunction with one another.

During coding, mandibular wear for sheep and goats was recorded following Payne's (1973) coding system, and retaining Payne's rough age classes for analysis. Two things should be pointed out: first, the classes provided by Payne were originally intended to be very coarse estimates, to be tested with further study of sheep/goat tooth eruption (Payne 1973: 299). Second, sheep/goat mandibles can also be recorded using Grant's system, which provides age estimates that are more 'sensitive' to variation among different age classes. The results can then be converted back into Payne age classes if one chooses, but not vice versa (Greenfield and Arnold 2008: 844). Regrettably only the Payne system was used during this analysis.

The results are presented in Figure 5.22. The majority of the sheep/goat mandibles belong to Payne stage C, 6-12 months, followed by stage B, 2-6 months. While most of the caprines appear to have been killed off before their first year, there are mandibles from older individuals in the deposits at Sarnevo. There is another smaller cluster in stage G, and 2 mandibles from individuals 8 years or older.

Such a profile, showing a high degree of infant/juvenile mortality, has been sometimes used to infer herding strategies on archaeological sites (for dairy production, e.g; Payne 1973: 285; Russell 2004: 325). If the majority of the young animals killed were males (impossible to tell at Sarnevo) dairying would indeed seem likely. However, as with cattle, decisions about herd kill off are embedded in a complex nexus of needs, from wool to milk to live animals for trading. Slaughtering surplus young animals for other purposes (i.e. for dairy production) may have made them ideal candidates for feasting food.

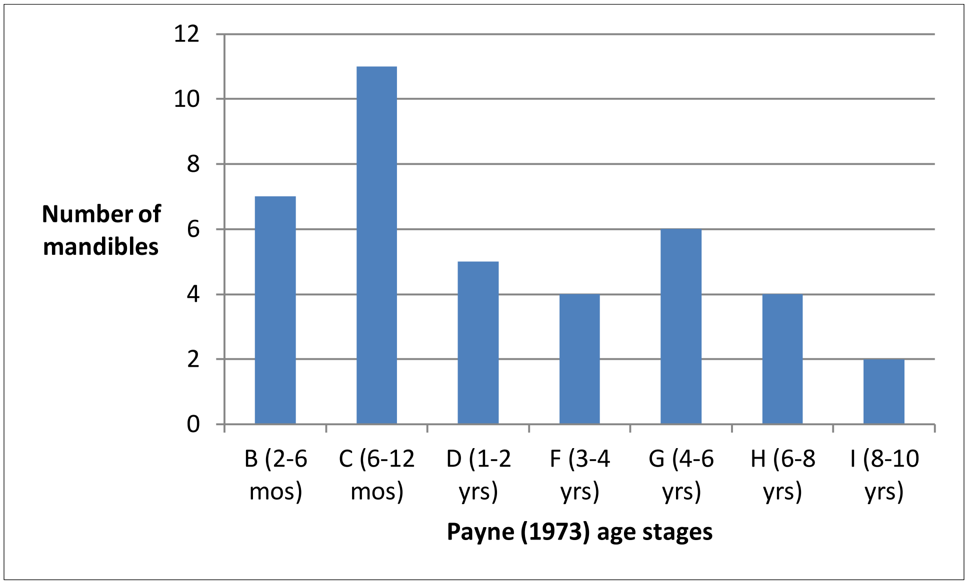

Figure 5. 22. Sheep/goat age stages based on tooth eruption and wear

The postcranial data generally reflect the same pattern of high juvenile mortality (Figure 5.23). Based on fusion data adults seem to be more abundant, but these age categories are generally less sensitive than mandibular wear.

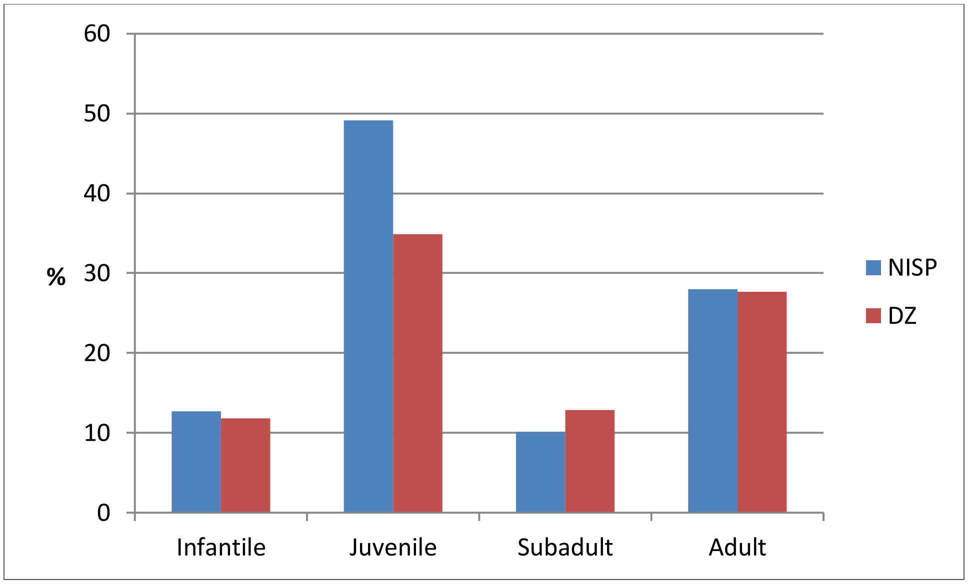

Figure 5. 23. Sheep goat age classes for postcranial material

Sex

Among the fragmented material at Sarnevo, only one pelvis was complete enough to determine the sex of the individual, an adult female sheep. Biometrical analysis provided a better way of trying to investigate sex-based cull patterns, although this could only be done on sheep measurements: too few goat specimens were recovered for measuring.

Sheep, like cattle, are relatively sexually dimorphic and so males and females should separate out nicely. For a standard animal comparison, Uerpmann's 1979 published sheep measurements were used. The specimen was a female mouflon from Iran.

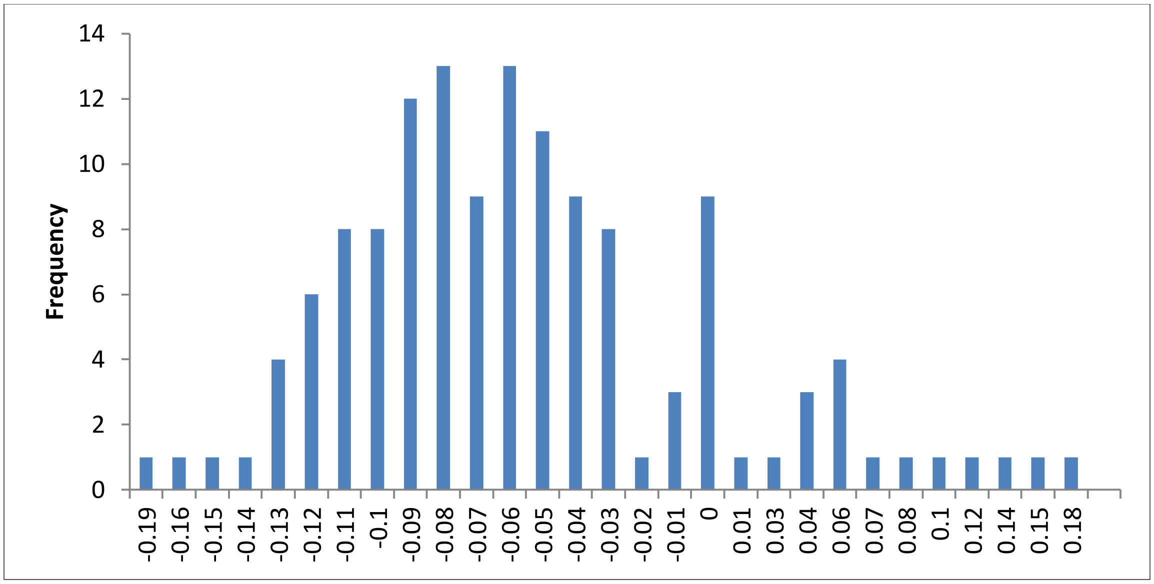

Figure 5. 24. Sheep standard animal values

The majority of the sheep specimens fall well below the range for the "wild" female used for comparison (Figure 5.24). Since male domestic sheep are likely to be the same size as female mouflon, the LSI suggests that a greater number of female sheep survived into adulthood (ensuring that they would be measured). With the high percentage of animals killed off between 2-12 months, it may be tentatively suggested that these younger animals are the males.

The same impression is given when the measurements are plotted separately (Figure 5.26). Again, the majority of the measurements fall below the female reference animal, with a handful that are larger. This is especially true with elements that should be much larger in males, such as the proximal metacarpal and the breadth of the trochlea of the humerus.

Finally, Figure 5.25 shows the breath plotted against the greatest lateral length for sheep astragali, and includes the reference animal for comparison. Although the sample size is small, the measurements do seem to cluster together below the reference female. Astragali do have the potential to be problematic, however, as they are a non-fusing bone and whether they are fully grown or not is hard to assess (N. Russell, personal communication).

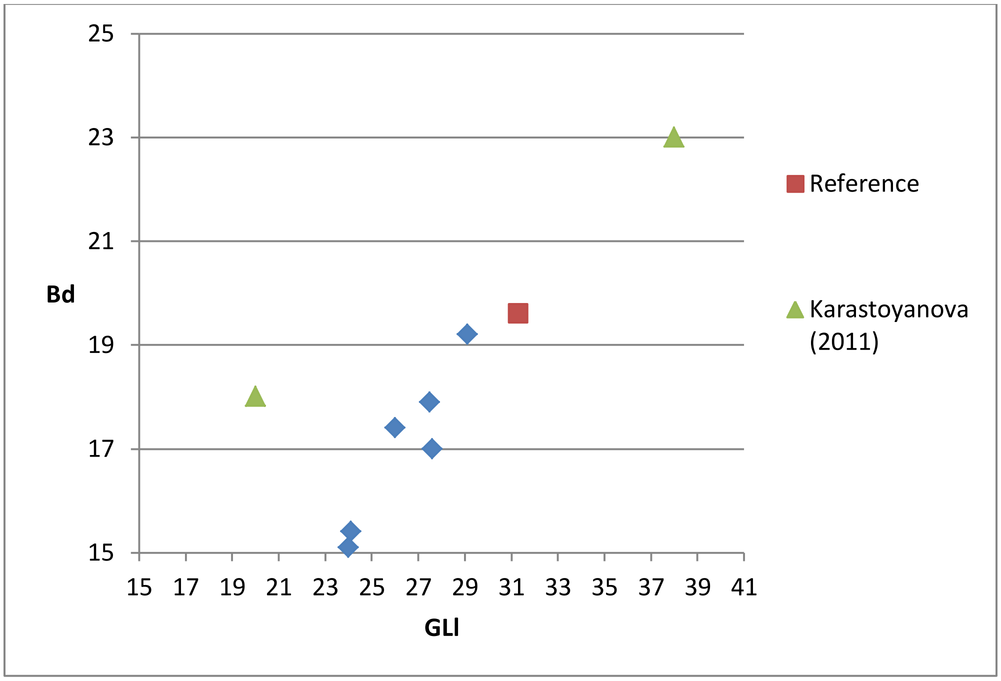

Figure 5. 25. Sheep astragalus measurements

These three figures all suggest that the majority of the measureable specimens at Sarnevo belonged to female individuals. Though the age data suggests that the majority of sheep were slaughtered young, clearly adult females were being kept around, most probably for dairying and reproducing herds. After their life use had ended, the female sheep were slaughtered and perhaps consumed along with lambs as part of communal events.

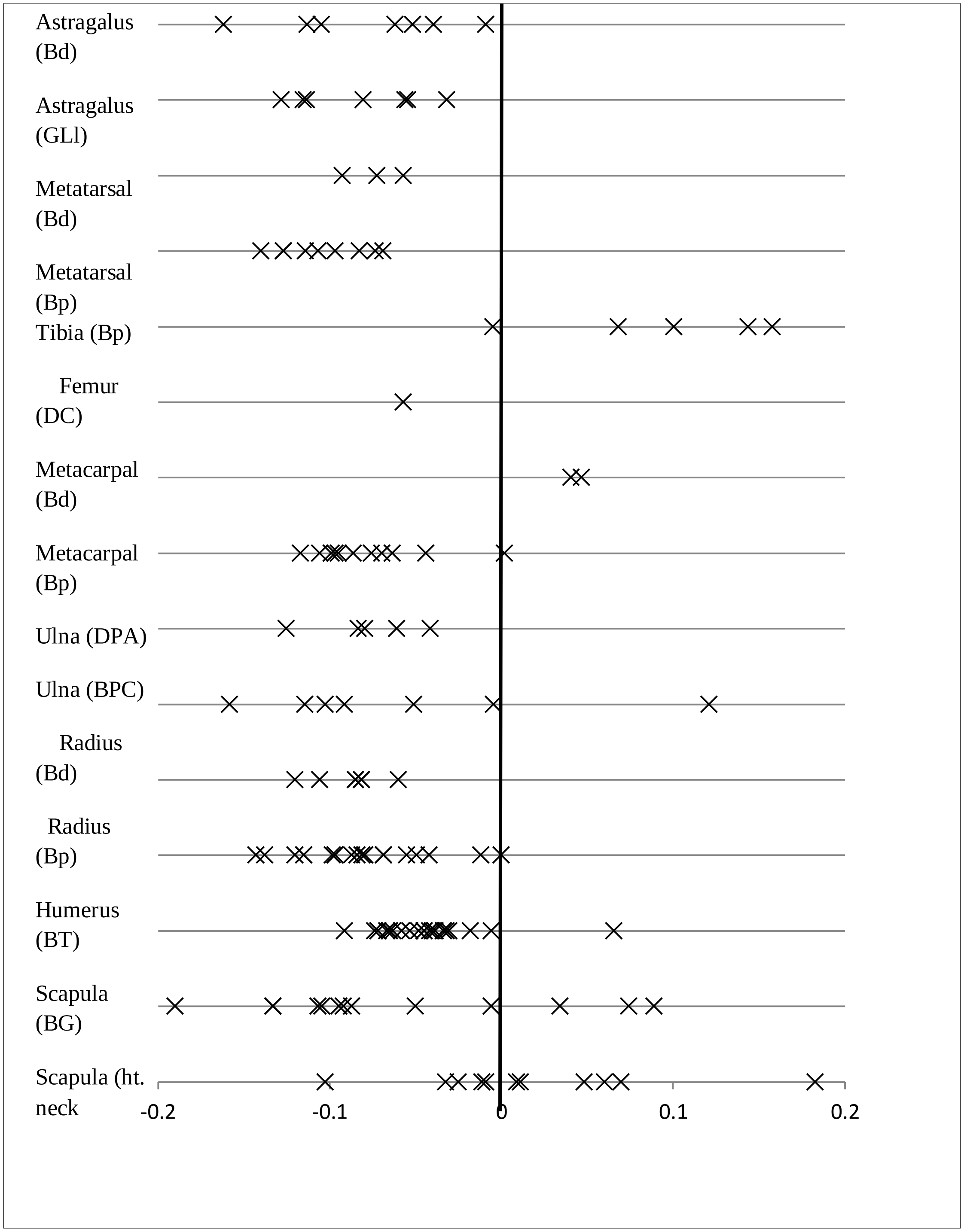

Figure 5. 26. Sheep measurements compared to the standard animal

Discussion: sheep/goat

There are a few things that can be said about the sheep/goat remains at Sarnevo. Even though a broader sheep/goat category was employed during analysis, where sheep/goat remains could be identified (and these were many, since there were a lot of intact articular ends), sheep are clearly much more abundant than goat. In a sense this could reflect different management strategies for the two species, perhaps related to the quality of the environment around Sarnevo during the late Neolithic. Yet it also could reflect cultural preferences for consumption. Perhaps goats were not as suitable for communal sharing as sheep, although clearly they are present and their low frequencies don't necessarily suggest some sort of avoidance of their meat, as with a partial taboo.

Cull patterns are tricky to interpret given the small sample of measurements, and the fact that only the elements of adult animals are measured. This means that while there is a high degree of juvenile mortality, it is impossible to guess at the sex of these younger individuals. It's tempting, as it was with cattle, to imagine that juveniles slaughtered are surplus males, and that the more mature specimens, which were measureable, are the females. Dairying is probable at this date, although a strict dairying profile would have a higher number of *infant* deaths.

Caprines account for nearly as much of the faunal material as cattle and deer. There seems to be no real indicator that they were any less available as a source of meat (see section 6 for their distribution by feature) or more or less appropriate for sharing at the communal scale, although obviously they would not have provided the quantity of meat that larger taxa would and could not have been shared as extensively. Their body parts do suggest that their carcasses were treated in a different way than both cattle and deer:the preponderance of mandibles goes beyond taphonomic vagaries and most likely reflect the high cultural value placed on them as sources of meat and marrow.

5.4 Pigs (*Sus scrofa*)

Relatively few remains at Sarnevo belong to pigs. Like cattle, wild pigs would have been roaming the area around Sarnevo, as some of the pigs identified at the site are clearly wild. Their potential to have been locally domesticated is extremely difficult to assess, given how easily pigs "go feral", especially if they are allowed to roam relatively unhindered around a site. Recent genetic work suggests that Near Eastern domesticated pigs made their way into Southeastern Europe, but that this stock was eventually transformed through extensive breeding with European wild boars (Larson et al 2007, cited in Conolly, et al 2011: 542).

It may be more useful to imagine that Neolithic pigs fall somewhere on a continuum between wild animals, which are free from human interference, and domestic animals, whose nutrition, reproduction and survival are completely dependent on humans (Meadow et al 2001: 50). The benefit of such a definition is that an analysis of anatomical measurements should be able to get at these distinct populations. Measurements should separate nicely if a population of domestic pigs were kept isolated from wild ones. The picture will of course become less clear if wild pigs are allowed or encouraged to breed with populations of domestic pigs, and a clustering of measurements somewhere in between the two ranges should be expected.

Attempting to separate out wild vs. domestic pigs at Sarnevo was complicated by low numbers of measurable specimens. In some analyses, an attempt is made at the time of coding to account for the wild or domestic status of pigs, with a category *Sus sp.* used for indeterminate specimens (Orton 2008). In this analysis, all pig remains were recorded as *Sus scrofa*, their wild or domestic status to be determined (mostly by biometrical analysis) afterwards. Only three specimens could be definitively determined as wild boar, based on their extremely large dimensions. One additional specimen is probably wild. Interestingly, two of the four specimens were recovered from Feature 28. While this shows that wild boars were in the area and occasionally hunted, it is difficult to say much else.

Body part representation

Figure 5.27 shows the body part breakdown for pigs at Sarnevo by DZ for both the pit features and non-pit contexts. Elements were grouped by broader body zones to deal with very small sample size according to the following criteria:

Head	Maxilla, mandible
Axial	Atlas, axis, sacrum, pelvis
Upper limb	Distal scapula, humerus, radius, ulna
Lower limb	carpals, metacarpals, tarsals, metatarsals
Hock (Foot)	phalanges

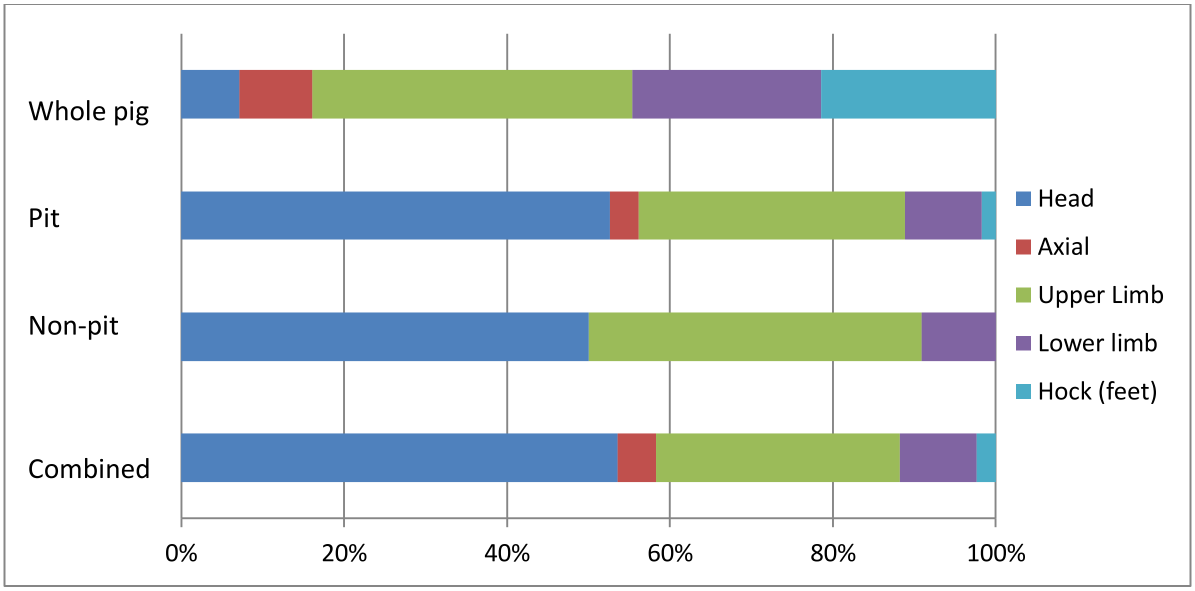

Figure 5. 27. Body zone proportions for pigs (%DZs)

The most apparent trend is for the head elements to be extremely overrepresented compared to their contribution to the complete skeleton. Head elements contain 4 diagnostic zones, two for the maxilla and two for the mandible. In the Sarnevo collection, 89% of all head elements were mandibles.

The fact that pig mandibles are robust and tend to survive in higher numbers does not seem to be enough to explain their high frequency at Sarnevo. No instances of butchery marks were recorded on any pig mandibles, but over 10% of them exhibited signs of brownish-black burning on the underside of the horizontal ramus. In addition, they were all cracked somewhere along the horizontal ramus, a very similar situation to sheep/goat mandibles. Contrary to modern notions of dining decency, pig heads seem to have been highly valued and made their way into the deposits with great frequency.

Upper limbs are present in roughly equal proportions to their distribution in the entire carcass, indicating that they were also utilized, but may not have been subject to the same culinary esteem as the heads. Lower limbs,feet, and axial elements are less frequent, probably as a result of preservation/recovery bias. Lower limbs mostly consist of carpals, tarsals and metatarsals, and unlike deer, pig metapodials (especially the more lateral and medial ones) are smaller and less robust.

Cull patterns

Age

Again, due to the highly fragmented nature of the animal remains at Sarnevo, trying to build a comprehensive age at death profile that incorporates both dental eruption/wear and epiphyseal fusion proved very difficult. This difficulty is underscored by the low number of pig remains in the assemblage. Given the extremely low number of pig elements in non-pit contexts (NISP=5, DZ=2), remains from both contexts were combined.

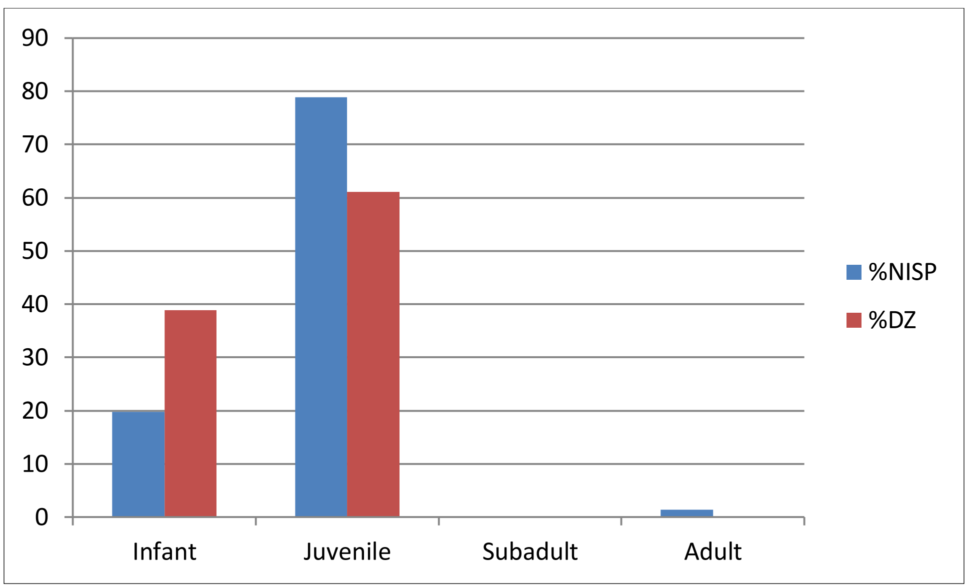

Figure 5. 28. Pig age classes based on epiphyseal data

Juvenile and infantile remains are much more abundant (Figure 5.28). Nearly all of the recovered pig elements belonged to such young individuals, a fact reflected in the very few specimens which were large enough to be measured. The majority of the pigs at Sarnevo were slaughtered before they were approximately 36 months of age.

Pig mandibles are generally very robust and so tended to survive in higher proportions that the remainder of the elements. Unfortunately, not that many actually survived with enough teeth intact to record wear according to Grant (1982). Normally one could estimate the mandible wear stage by comparing the teeth that are remaining to a complete reference mandible. This was not possible at the time of recording.

Discussion: Pigs

High proportions of juvenile pigs are usually argued to be the result of humans selectively culling a herd over which they have tight control, especially in a time and place where domestic pigs are known to have existed. Rowley-Conway, et al. (2012:23-28) have recently pointed out the problems with this approach, arguing convincingly that high juvenile mortality rates, especially among males, can be the result of ecological factors or human hunting strategies. There is also the fact that pigs, unlike other domestic ungulates, give birth to litters, producing a population with more young animals (Russell and Martin 2005: 63).

The pig body parts counts show that head elements are overrepresented, because of the high amount of mandibles. As with the sheep/goat, they seem to have been burned and cracked open for marrow. But unlike the sheep/goat, upper limb portions are also well represented, while elements of the lower limbs and hocks are less common.

Clearly pork was consumed at Sarnevo. Pigs do well in forested environments, as Bulgarian Thrace was at this time, and so, wild or domestic, it is interesting that pigs should make up such a small proportion of the faunal assemblage. There is always the possibility that there existed some sort of partial taboo on pork meat, as has been suggested for Çatalhöyük by Russell and Martin (2005: 65).

5.5 Deer (*Cervus elaphus, Dama dama, Capreolus capreolus*)

The presence of wild cervid remains is well attested on Bulgarian Neolithic sites (Popov et al 2007) as well as sites throughout Southeastern Europe during the Neolithic. Generally red deer are the most abundant species at Bulgarian sites, as they are in the central Balkans (Orton 2009:9), although this is not always the case (c.f. Manhart 1998 for Durankulak). At Sarnevo three species of deer were present: red deer (*Cervus elaphus)*, fallow deer (*Dama dama*), and roe deer (*Capreolus capreolus*) (Figure 5.29). There is no real difference in relative abundances between pit features and non-pit features for cervids: fallow deer dominate the assemblage in both cases.

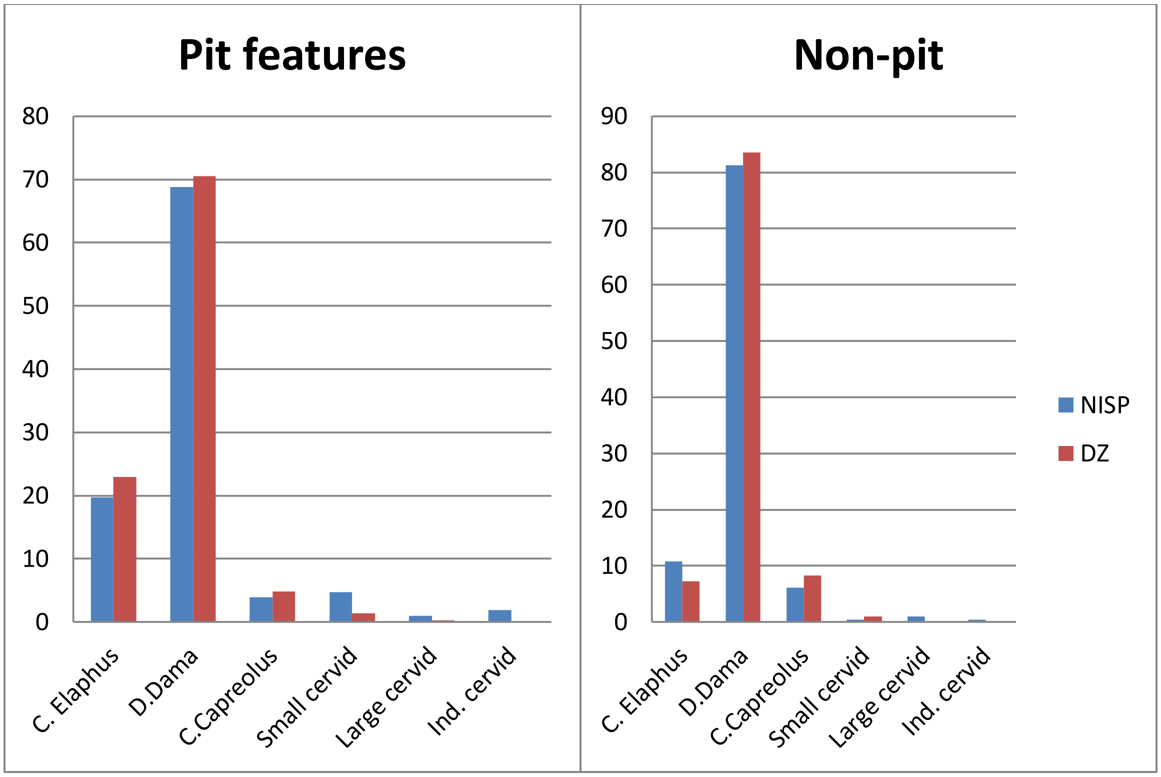

Figure 5. 29. Relative abundance of cervids at Sarnevo.

Cattle-sized red deer are the largest of the cervids at Sarnevo, followed by fallow deer and then roe. The remains of all three of these deer were relatively easy to distinguish based on size alone, and the morphology of their teeth is distinctive enough to assess fragmented mandible remains. In some cases, though specimens could be identified as cervid (as opposed to bovid), they could not be assigned further than “small cervid” or “large cervid”. In a miniscule number of cases (NISP=13, DZ=0), the category indeterminate cervid was used.

Body Part representation

The sample size for *Dama* is large enough for a consideration of their body part seperately from the other deer. For red and roe, not enough material was present for such an analysis, and so they have been grouped together into larger body part categories, following the same criteria as the pigs. Antlers are not included in DZ calculations, but should not be a problem because their total NISP is 12.

When separated by context, there was little difference in the proportions of body parts present for both pit and non-pit contexts, despite (or because of) the extremely small sample size in the latter. Therefore the contexts have been combined.

Figure 5.30 shows the proportional representation of all cervid body parts without *Dama* included, as a percentage of total DZ, with the representation of body zones in a complete deer carcass for comparison. It is striking how similar the body part distributions are. No body zone(s) appears to be over or underrepresented amongst the archaeological sample, and axial elements seem to be more frequent. The majority of deer carcasses, it seems, were brought back from the location of the kill to the site.

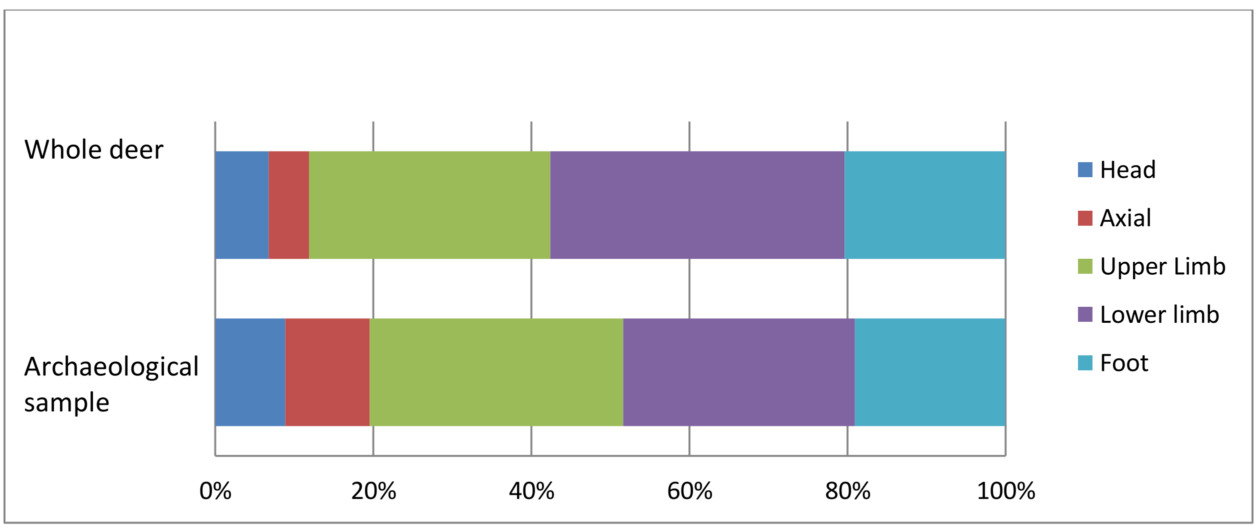

Figure 5. 30. Deer body zones without Dama remains included.

When the remains from *Dama* are added in for comparison, the picture is slightly different (Figure 5.31). Foot elements are underrepresented, and upper limbs are overrepresented. The feet elements may simply be absent due to recovery bias, something which was less likely to affect the other deer, thanks to the large size of red deer phalanges. As for the upper limbs, their high frequency is no doubt due to the preponderance of *Dama* scapula fragments, described below.

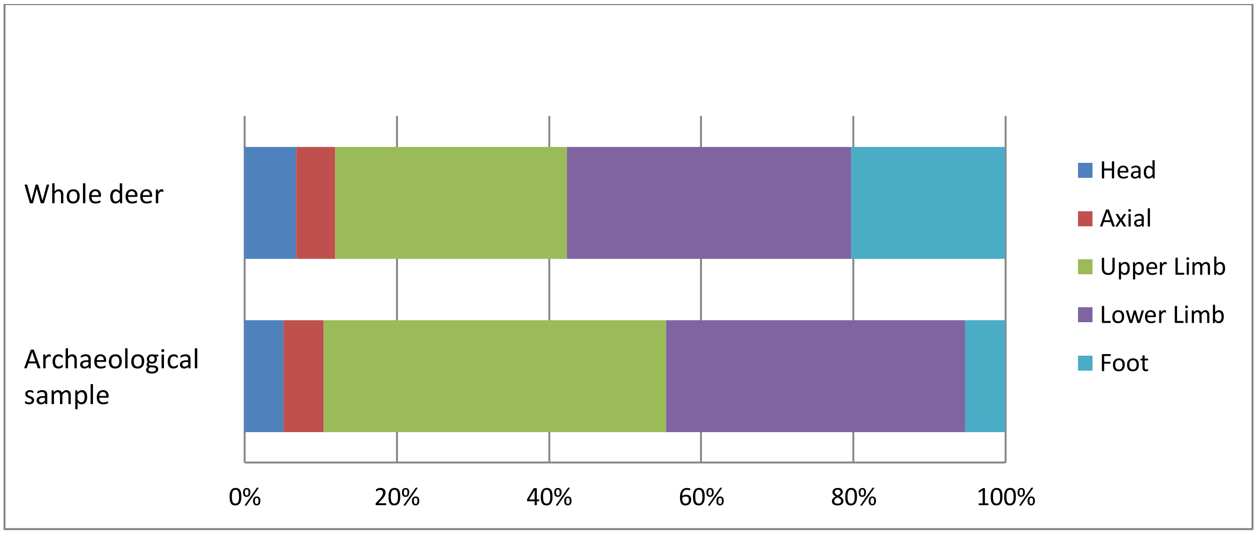

Figure 5. 31. Deer body zones with Dama included.

5.5.1 Fallow deer (*Dama dama*)

Fallow deer are the most abundant cervid at Sarnevo. This is rare for Bulgarian sites, where fallow deer normally do not make up a significant portion of the faunal remains. An exception would be Durankulak, where Manhart (1998) reported that fallow deer made up 44% of the total assemblage. Fallow deer prefer a more open habitat, congregating near clearings and forest edges (Geist 1998:5-6). In this sense they may have been quite abundant in areas where large sections of forest had been cleared for agriculture, which may well have been the case in Bulgarian Thrace

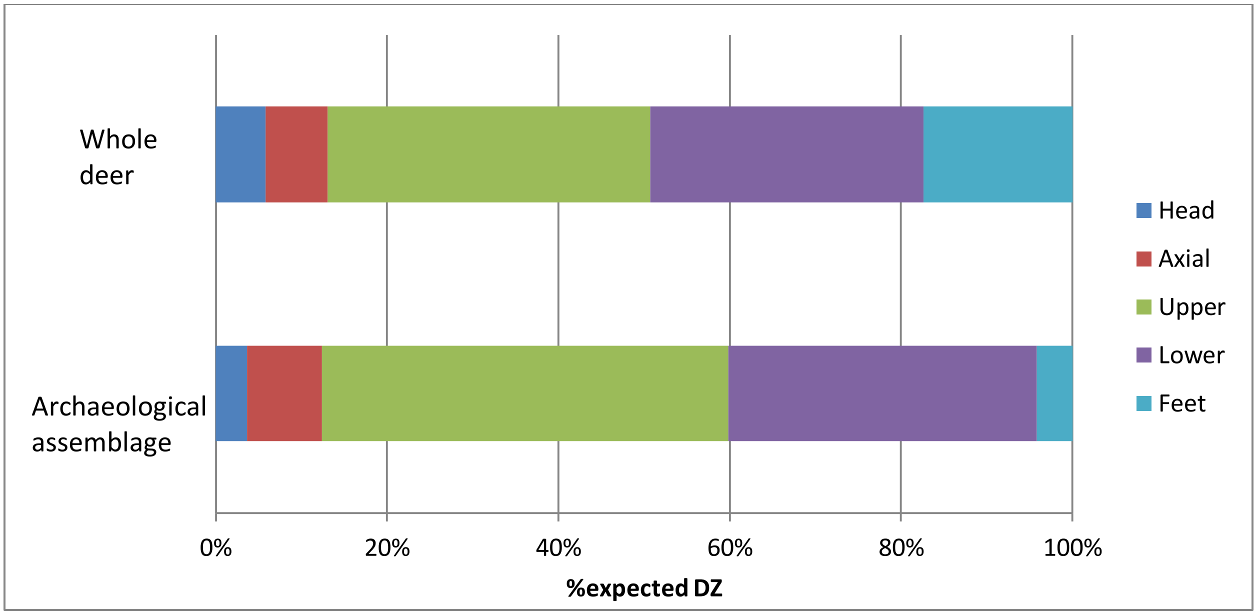

Figure 5. 32. Fallow deer body zones.

Figure 5.32 shows the proportion of fallow deer elements when grouped into body zones. Unlike the other cervids, upper limbs are overrepresented compared to their make-up in a complete fallow deer skeleton. If this pattern is real, and not the result density mediated processes (all of the densest part of the limbs are contained in the upper limb zone), it may suggest that fallow deer carcasses were treated differently in the field than other deer. More upper limbs appear to have been transported back to the site. Fortunately, the fallow deer sample was large enough to take a more in-depth look at body part representation, shown in Figures 5.33-36. The body part distribution indeed appears to be density related. In addition to the scapula, which is overrepresented, the most frequent parts are the distal humerus, proximal radius, and distal tibia, along with the tarsals (calcaneus, astragalus). This distribution is even more marked outside of the pits (except for the scapula).

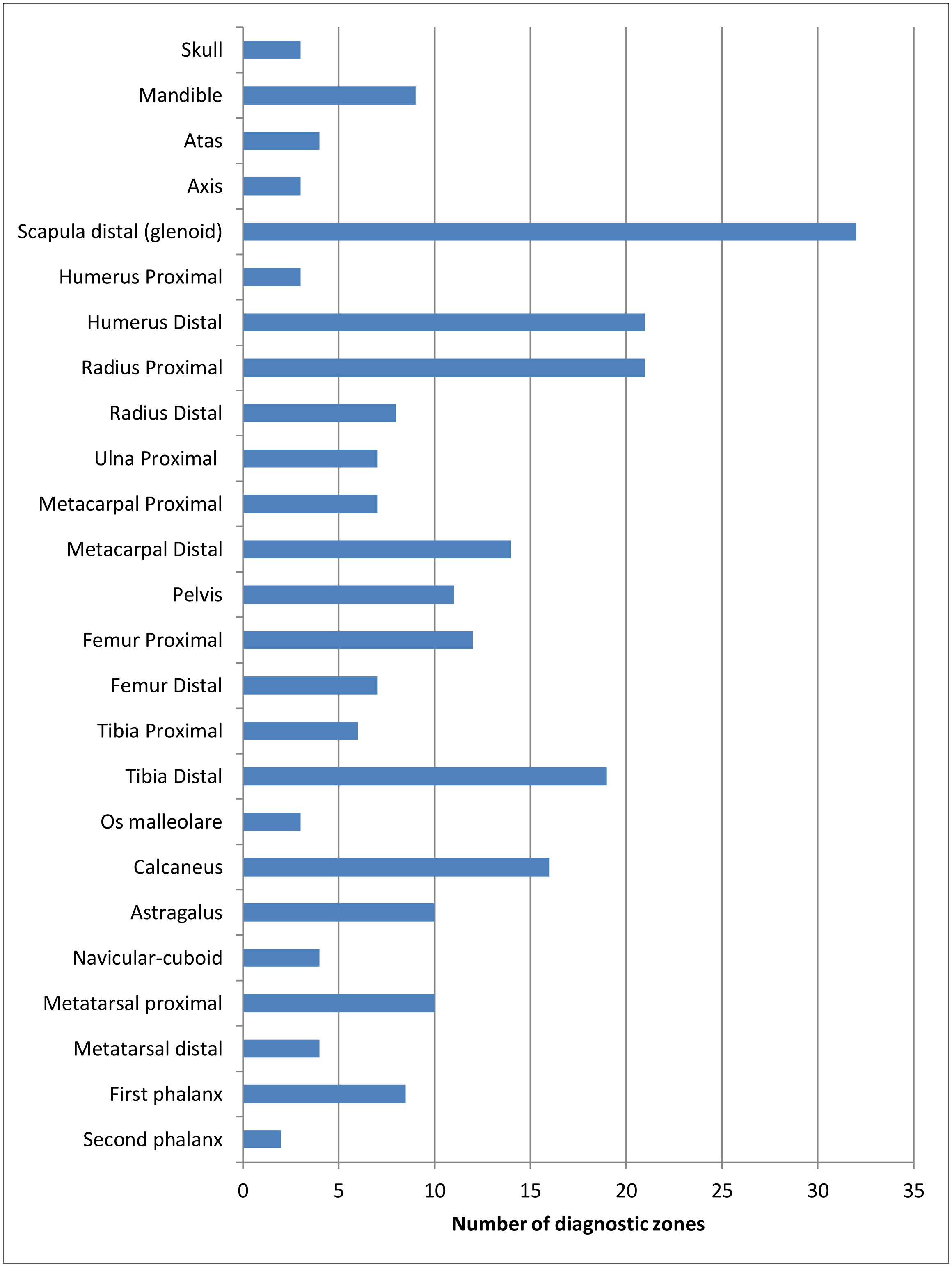

Figure 5. 33. Fallow deer body parts for pit features: number of DZs

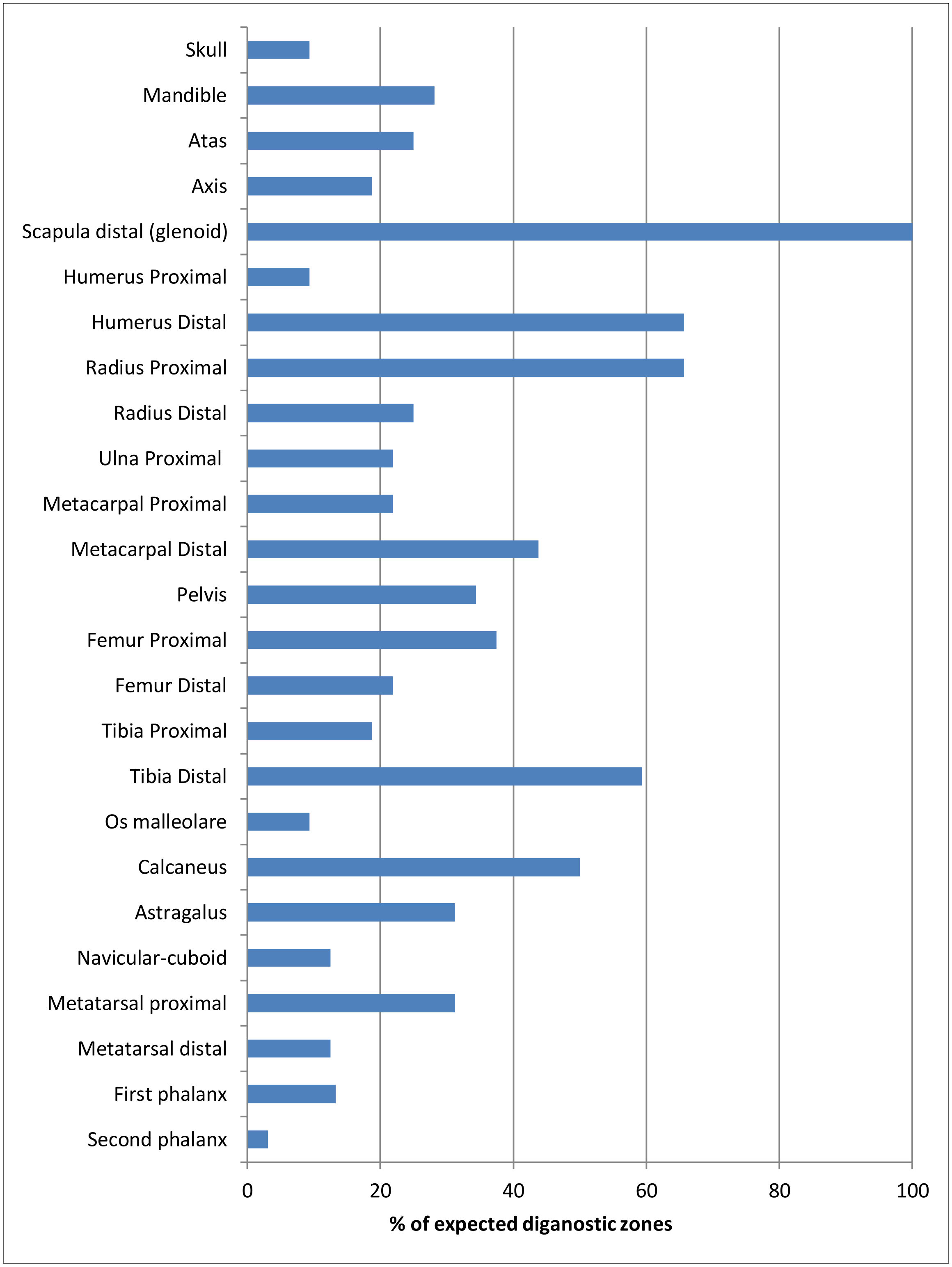

Figure 5. 34. Fallow deer body parts for pit features: % of expected DZs for intact carcasses.

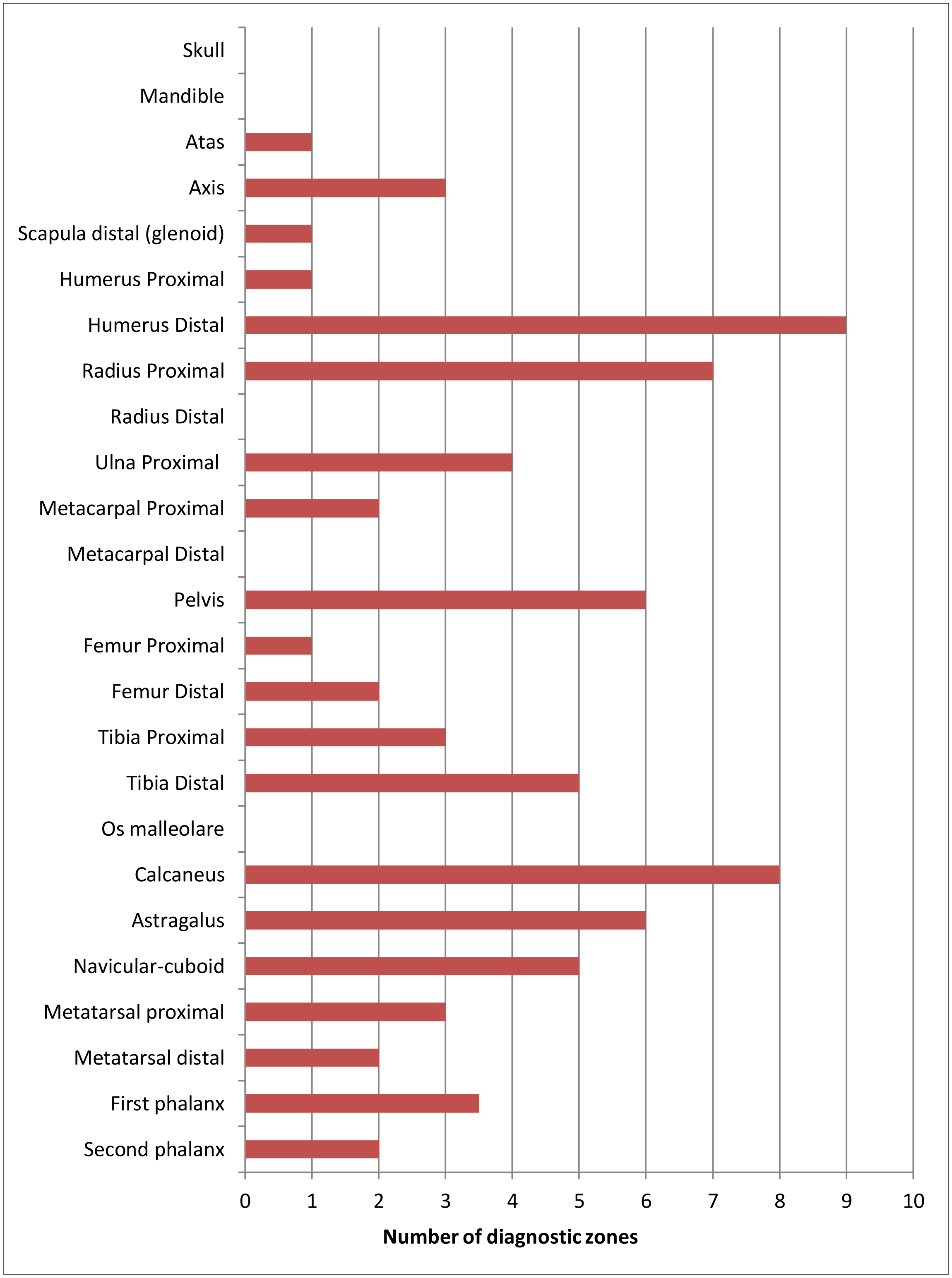

Figure 5. 35. Fallow deer body parts for non-pit contexts: number of DZs.

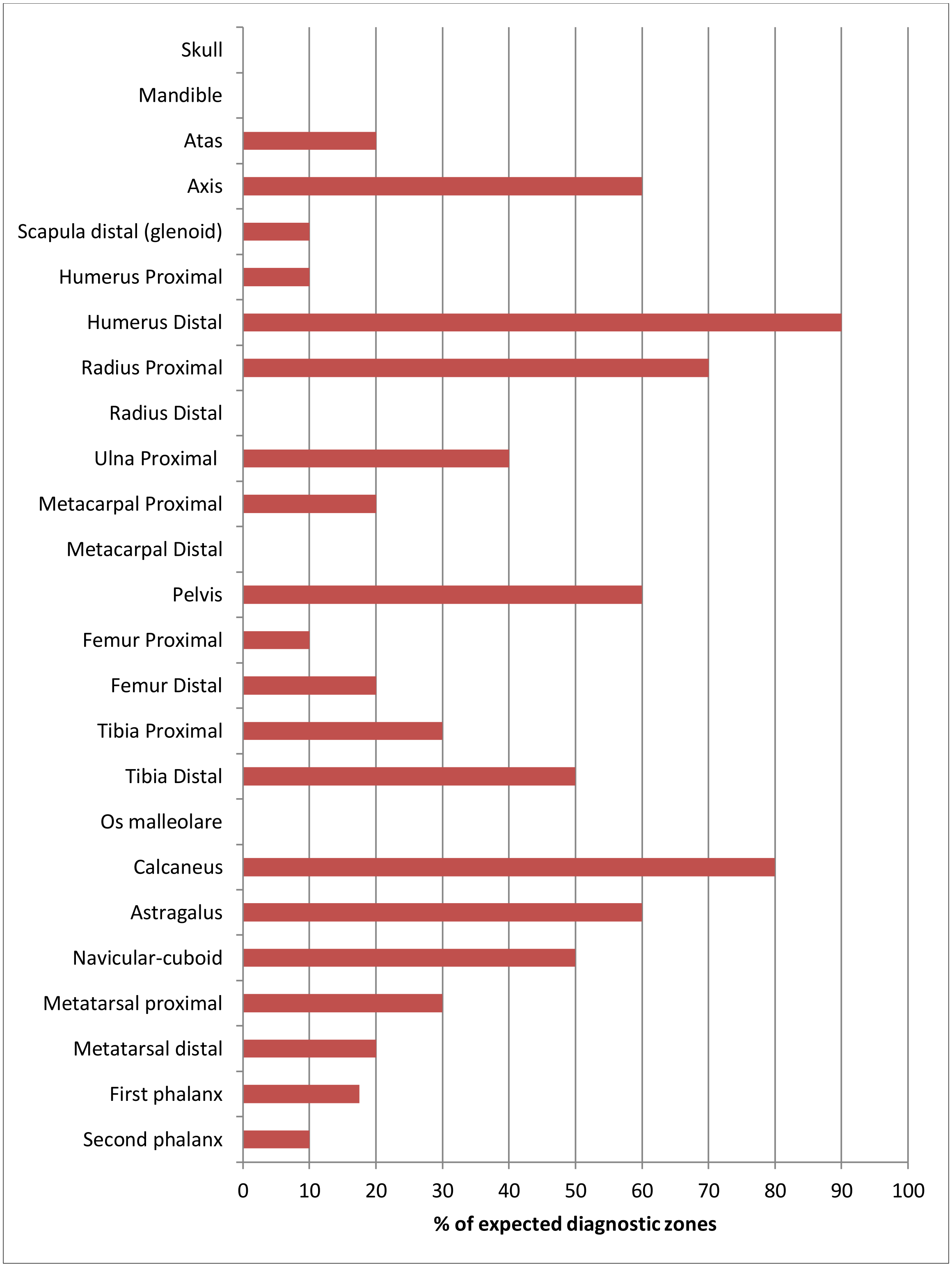

Figure 5. 36. Fallow deer body parts for non-pit contexts: % of expected DZs for intact carcasses.

Cranial and axial elements seem also to be less frequent, both for the pits and non-pits. Reasons for a low frequency of these elements may be due to the way diagnostic zones are calculated (most of the axial skeleton is included in the scrap category, and skulls are also highly fragmented), or the fact that cranial elements may have been curated differently, especially for males with antlers.

The cervid data suggest that deer were being brought back to Sarnevo in relatively large portions, indicated by the high amount of both upper and lower limb elements being brought on site, which matches closely the distribution of body zones in intact skeletons. This contrasts to a profile dominated by mostly head and feet elements, which would suggest that only deer hides were being brought back from hunting trips (e.g at Çatalhöyük; Russell and Martin 2005: 61).

Cull patterns

Sex

Metrical analysis provided the best way to try to get at a sex profile among fallow deer. Two advantages to using measurements in the case of deer are that they are typically very sexually dimorphic, and that there is no domestic population to confuse the measurements, as was the case with cattle.

For this analysis, two reference specimens from the Hungarian Agricultural Museum, an adult male and adult female were used. These specimens were recorded by Nerissa Russell in 1986. According to her, neither specimen was considered to be remarkably large or small. When calculating the log size index, the average of the male and female was used first, and then the LSI was run again using the male animal as the standard for comparison but also to see how

Neolithic fallow deer stacked up to their modern descendants.[7]

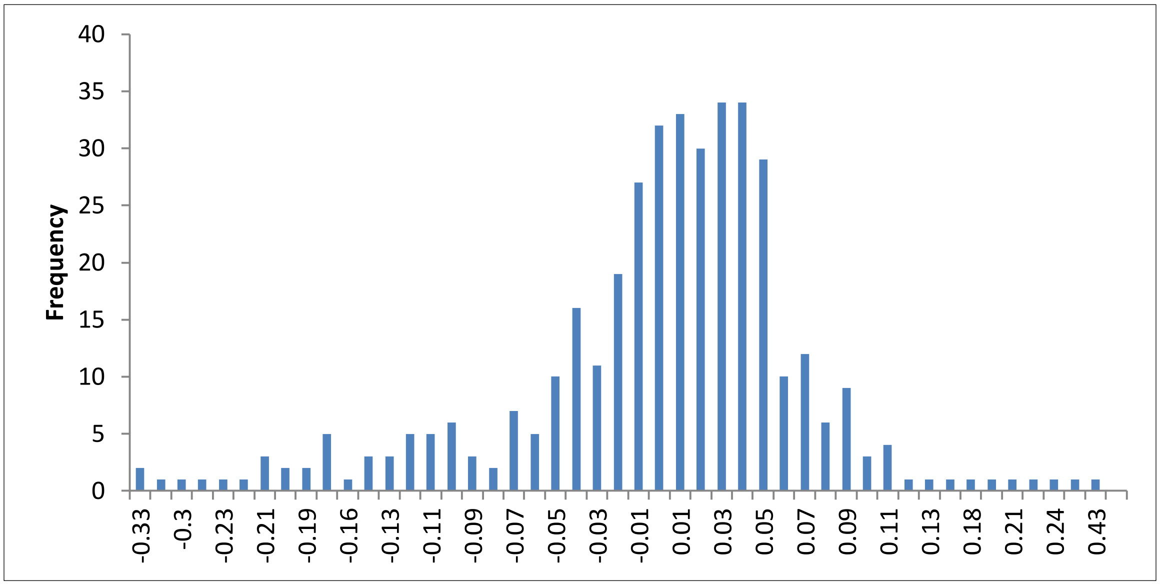

Figure 5. 37. Dama standard animal values, where the standard is the average between the male and the female reference animals..

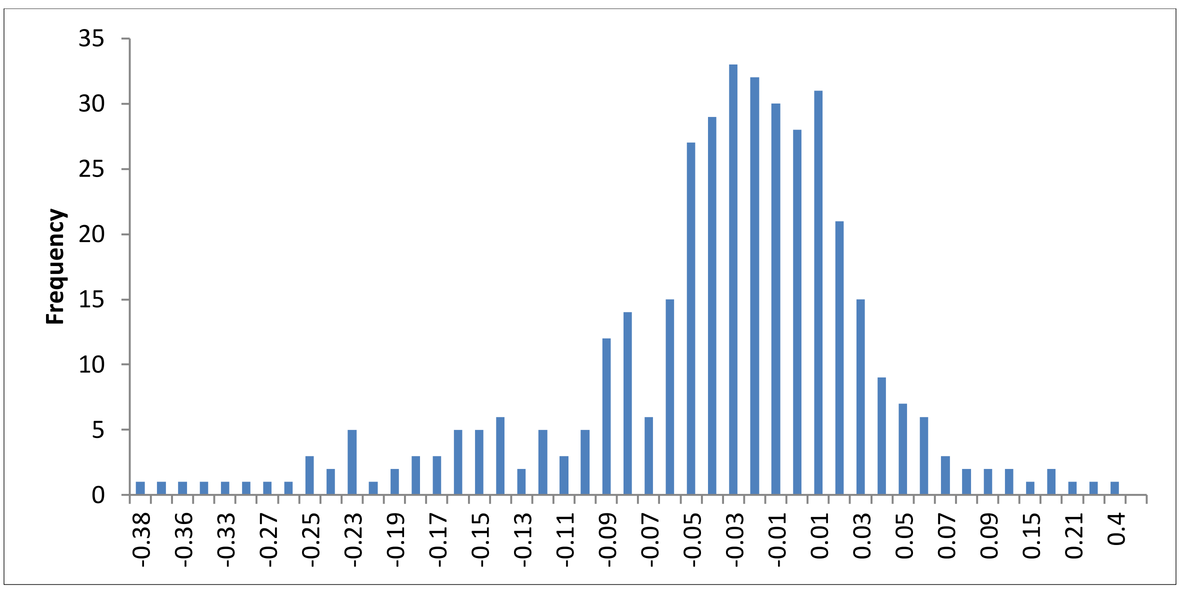

Figure 5. 38. Dama standard animal values, where the standard is the male reference animal

[7] Fallow deer are presumed to have gone extinct sometime in the medieval period, only to be reintroduced later in the modern era (Popov et al 2007: 44)

When the male/female average is used (Figure 5.37), the greater part of the measurements clusters on either side of the standard, whereas when the male standard animal is used (Figure 5.38), the measurements for the most part fall below, although there are quite a few which are larger. However, in neither case is there a strong argument for a predominantly male or predominantly female population.

Since deer are sexually dimorphic, plotting the measurements of several elements, especially forelimbs, might reveal a sex profile biases toward wither males or females. Figures – plot the breadth aginst the length/depth of the scapula (glenoid), proximal and distal MC, and proximal MT. I have included the male, female, and average reference animals for comparison.

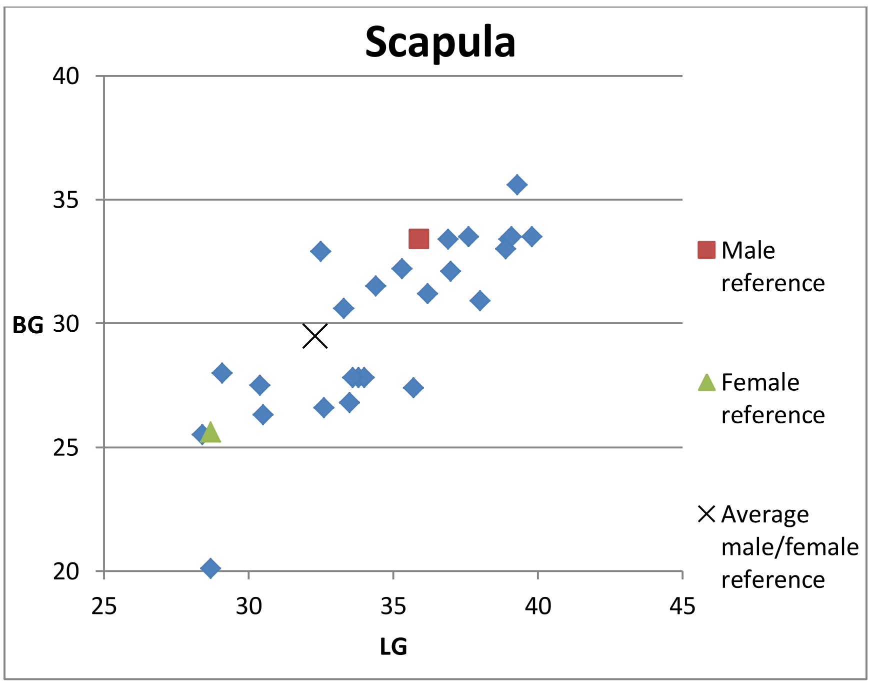

Figure 5. 39. *Dama* measurements

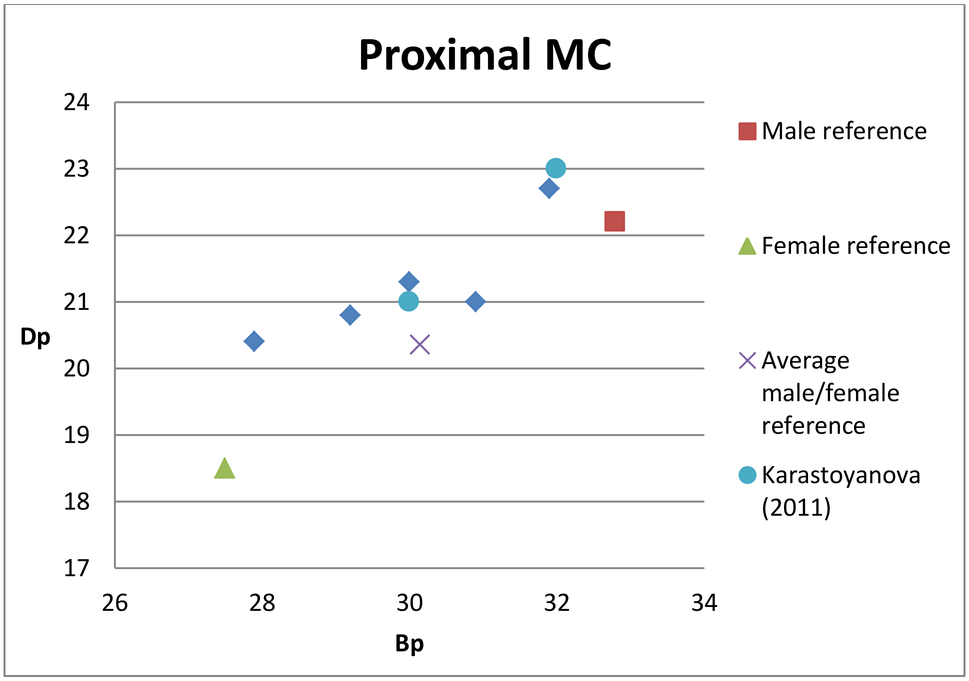

Figure 5. 40. ***Dama*** **measurements.**

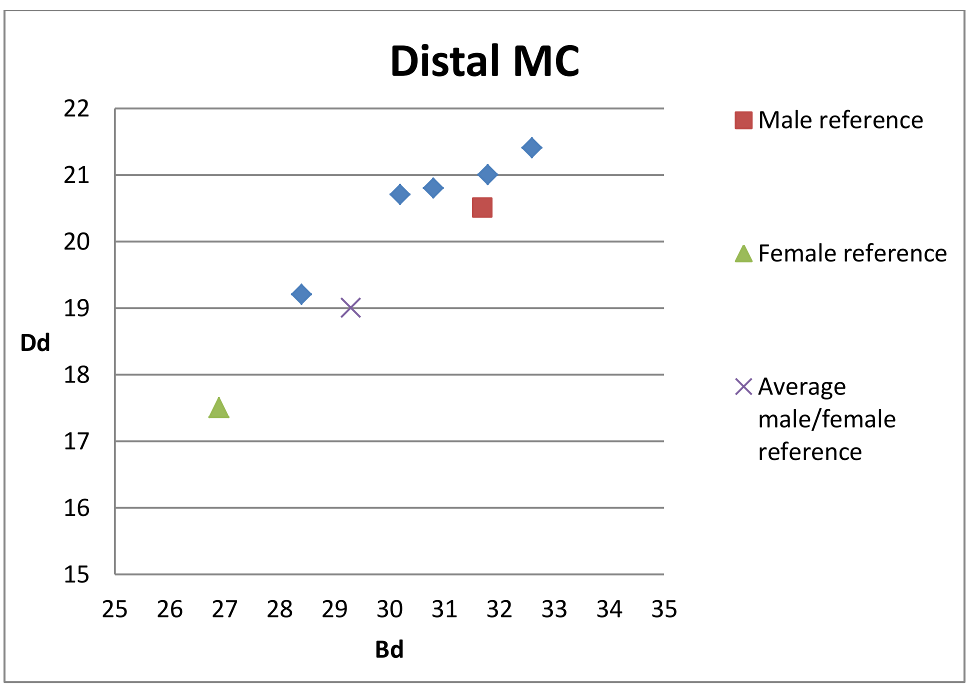

Figure 5. 41.***Dama*** **measurements.**

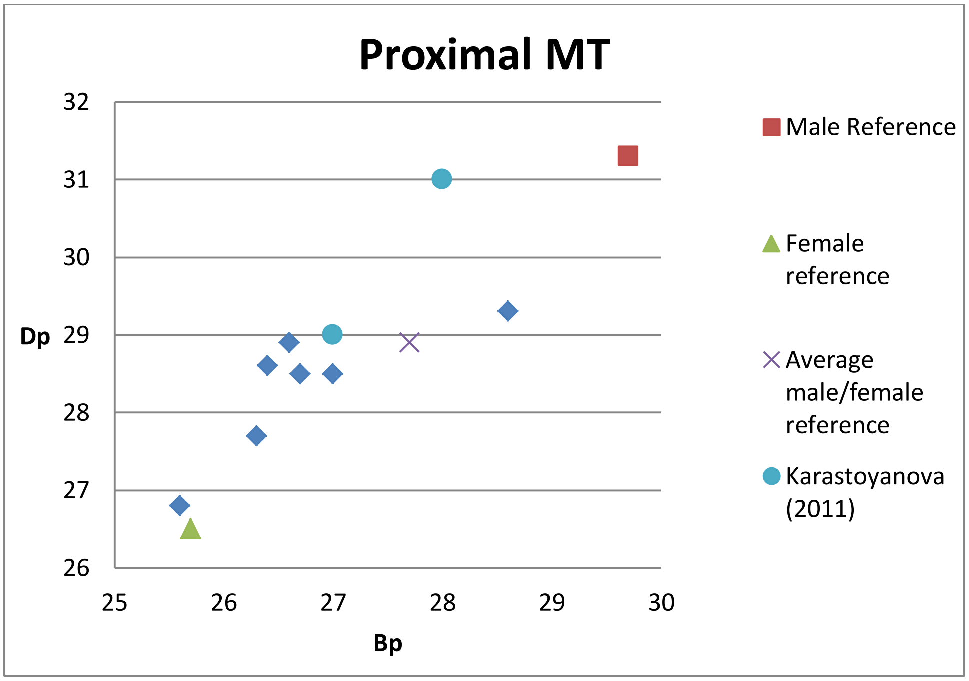

Figure 5. 42. *Dama* measurements.

Scapula measurements show two tentative groupings, with many clustered around the male reference animal and some around the female, the remainder falling somewhere in between (Figure 5.39). The proximal metacarpal clusters more around the average of the male and female specimen used in the analysis, whereas the distal metacarpal measurements are much more clearly clustered around the male. Finally, the distal metatarsal measurements seem to cluster in between the female and the average standard animal.

These charts again give the impression that there was a mixed population of both males and females, perhaps with a slight bias towards males. At the very least, the scapulae seem to be largely from males. Perhaps the reason that they are overly abundant in the first place is due to some special curation practice which favored the larger male scapulae. Karastoyanova (2011: 37) ran a regression analysis on the distal tibiae (using Bd and Dd) and found that the measurements nicely separated into male and female groups, the males being far more abundant.

Discussion: deer

Deer factor prominantly in the lives and the diet of the people who used Sarnevo. While deer are not unknown on Neolithic sites in Bulgarian Thrace, it is rare to find them in such high abundances, even in the Late Neolithic. The proportion of fallow deer relative both to other deer and other major food mammals, like cattle, is quite unexpected. Though we do not completely understand the nature of the landscape at the time, it may have been a prime habitat for fallow deer: a sort of mixed forest with plenty of cleared space. Fallow deer may have been attracted to land that had been cleared for agriculture, but they were not simply hunted as crop raiders. The body part analysis suggests that deer were mostly brought back intact to the site, with the exception that fallow deer scapulae may have been brought back to the site in many cases where the remainder of the carcass was not. Though male animals were no doubt prized for their ornate antlers (and there were a few pieces of fallow deer antler in the assemblage), and perhaps scapulae as well, hunters seem to have indiscriminately killed both males and females. The analysis here siggests a bias towards male animals, and when combined with Karastoyanova's data this pattern of male targeted hunting become even clearer.

Other deer were hunted as well. The larger red deer is less frequent in the assemblage, and may have been encountered only rarely in hunting trips further away from the settlement area. Red deer are noted to be notoriously large in this part of Bulgaria during the Neolithic and Chalcolithic, before widespread habitat degradation due to deforestation (N. Spassov, personal communication), and would have provided copious amounts of meat. Feasting may have been triggered by the successful hunt ofa red deer

The high proportion of fallow deer upper limbs may indicate a different strategy of exploitation, where scapulae were brought back with a higher frequency than other body parts. This might possibly be a result of the abundance of fallow deer. If fallow deer were in truth much more plentiful in the area than other types of cervids, this seemingly more wasteful method of butchery may mean that hunters were less concerned with transporting as much of the fallow deer carcasses, since they could be relatively certain of future kills. Additionally, if other cervids were rarely encountered (as with the more solitary red deer), killing them may have warranted the transport of all of their body parts to the site. Of course, there is always the assertion that killing large wild game can trigger feasting, which would certainly not be impossible for Sarnevo, given the abundance of deer (Twiss 2008 422).

Roe deer, the smallest of the extant cervids at the time, are difficult to interpret, as their remains are so few. They, like fallow deer, prefer habitats of a mixed forest-meadow type, and may very well have been hunted only as crop raiders, as they approached human cleared land (Danilkin and Hewison 1996:61).

As I suggested in section 3, hunting deer could have served as a way for skilled hunters to accrue prestige, through the act of hunting itself or through their ability to provide large amounts of meat during feasts (or both). Sharing the meat of wild animals would thus achieve the same end for hunters as it would for herders who share domestic meat. The large, ornate and unique palmate antlers of male fallow deer would have made impressive trophies, as would the antlers of red deer. If put on display, they could have served as reminders of past hunts and feasts, or as markers of the skill of the hunter. Though not as dangerous to hunt as aurochsen, bringing down large deer would have required a good deal of hunting knowledge and prowess, and probably also required the organization of hunting parties. As mentioned earlier, hunting wild animals has both materialist and social aspects and often has an important role to play in the negotiation of social identities (Orton 2009:14).

5.6 Other mammals

5.6.1 Domestic Dog (*Canis familiaris*)

The remains of domestic dogs are present but not common in the pits at Sarnevo. It is unclear to what extent they were consumed at the site, although the presence of one mandible fragment with brownish-black burning and 4-5 parallel cutmarks on the horizontal ramus might suggest that they were in fact consumed. Their remains are as fragmentary as any other species, possibly indicating that they too were broken open for marrow or bone grease extraction. There are no partially or completely articulated skeletons in the assemblage from the Late Neolithic.[8]

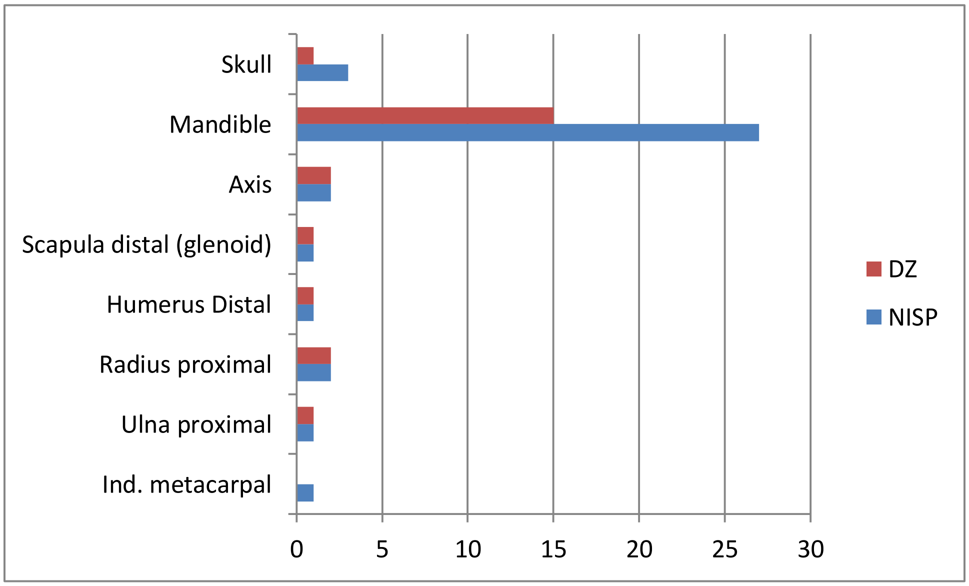

Figure 5. 43. *Canis* body parts.

Mandibles comprise the majority of canid specimens. This may be due in part to their robusticity compared to other elements of the skeleton. Interestingly, there are no remains from the hind leg;

[8] The Roman Period pits provide a nice contrast here, as there are multiple partial or complete dog burials.

what little postcranial material is present is from the front leg only. The remainder of the *Canis* elements not represented on this chart are loose lower teeth (NISP=4).

Because of the small sample size, it is difficult to determine cull patterns for domestic dogs. Only three specimens could be assigned an age class; a humerus and two mandible fragments which belonged to adult individuals.

It is difficult with such limited data to determine the role of dogs at Sarnevo. Clearly they were not consumed in large numbers (or consumed and deposited elsewhere), but rituals involving dog cranial elements may have taken place at the site. Karastoyanova identified a broken adult dog skull (deposited whole) in Feature 9. It was missing the mandibles, but retained nearly all of the maxillary teeth. She did not report any signs of butchery or other cut marks, and did not speculate on its presence in the feature (Karastoyanova 2011: 69). Since the occurrence of carnivore gnawing is very low, dogs may have been actively kept away from the site and perhaps dog meat was partially taboo.

5.6.2 Small wild species

In addition to major food mammals, small, fur bearing species are oftentimes encountered on Neolithic sites in SE Europe. At Sarnevo, however, there are very few elements from these species.

Only one specimen, a mostly complete atlas, was identified as fox (V*ulpes sp.)*. No polecat (*Vormela peregusa)* remains were identified in the pits in this study; however it is worth mentioning that Karastoyanova did identify one complete skull in Feature 9. No traces of burning, butchery or other cut marks were on the specimen (Karastoyanova 2011: 27).

5 specimens (5 DZ) were attributed to the European hare (*Lepus europaeus*), including a complete humerus.

Table 5. 3. *Lepus* specimens

Element	NISP	DZ
Ischium+pubis	1	0
Mandible with teeth	1	1
Humerus	2	3
Ulna	1	1
Total	5	5

5.6.3 Birds, Mollusks and Micro-fauna

Bird bones, mollusk shells, and the remains from micro fauna (i.e., smaller than rabbit) were not analyzed as part of this thesis. In part this was due to time constraints, but also to the author's unfamiliarity with these taxa and the lack of a good reference collection at the place of coding. Instead they were quantified and set aside for analysis in the future. In addition to mollusks, land snail shells were also saved and quantified, but these will get no discussion here as it is most likely that they are not the result of intentional deposition.

Table 5. 4. Birds, molluskcs, and microfauna

Taxon	NISP
Bird	64
Mollusk	67
Micro fauna	12

5. 7 Fragmentation

The majority of the specimens from Sarnevo were placed into the undiagnostic or "scrap" category (see section 4). Any bones that are whole are mostly small, dense elements such as carpals, tarsals, phalanges, and teeth. Far from being useless, indeterminate or undiagnostic fragments do yield useful information about faunal assemblages (Outram 2001: 402).

The most pressing question is the origin of the fragmentation at Sarnevo. Is it the result of human agency or post-depositional processes? Breaking bones for marrow or bone grease are the most common anthropogenic reasons for bone fragmentation, while other, non-human agents include carnivore attrition, sediment compaction, and a range of biochemical processes that affect bone (Binford 1978; Outram 2001: 402-3; Stiner 2003: 29).

Methodologies for analyzing bone breakage vary from studying the intensity of fragmentation by placing fragments into fragment size categories (Lyman 1994); to studying the characteristics of bone breakage such as fracture angle and morphology (Villa and Mahieu 1991, cited in Outram 2001). Outram (2001), in search of an expedient yet comprehensive way to analyze fractured bone assemblages, developed the freshness fracture index (FFI), a measure of how many of the fragments were broken when the bone was fresh due to human activity.

For the collection at Sarnevo, such an in-depth analysis was not performed at the time of recording. When describing specimens, several general observations of bone fragmentation were recorded:

- **Origin of fragmentation**: a general observation of the relative age of the fracture. Categories included *all ancient breaks; mostly ancient, some modern; mostly modern, some ancient;* and *modern*.

- **Fragment size**: how much of the fragment was preserved *(<1/4, 1/4 to 1/2*, etc).

- **Fragmentation** (for long bones only): a category which describes what portion of the element is present: *shaft splinter, cylinder, end+shaft splinter,* etc.

These categories provide enough information to make some tentative conclusions about the fragmentation of the faunal assemblage. First, much of the assemblage suffered modern damage, most probably related to excavation using primarily picks, shovels, and trowels. 5.7% of the fragments show only modern breaks, so it is impossible to assess the contribution of pre or post depositional factors to their original fragmentation. 43% of the fragments show only old breaks, suggesting that they were broken prior to deposition or as a result of post depositional processes later on (see next section). The remainder of the fragments exhibit varying degrees of old plus modern breaks, in some cases making it impossible to determine the original length of the fragment. If the number of fragments that show modern breaks in some quantity are combined, 51.4% of the entire assemblage suffered some sort of damage during or after excavation.

Table 5. 5. Origin of fragmentation

Text equivalent	n	%
Whole	612	5.320814
All ancient breaks	4977	43.27074
Modern (all modern breaks)	657	5.71205
Mostly ancient breaks, some modern	4051	35.21996
Mostly modern breaks, some ancient	1205	10.47644
Entire assemblage	10348	

Second, it appears that marrow extraction did in fact take place at the site. Assemblages that are processed for marrow, usually in the presence of heat, tend to leave behind a large number of articular ends (Binford 1978: 153-154), which are usually left intact unless they are further processed for bone grease, in which case they will also be heavily fragmented. Bones may not have been processed for grease as collecting the articular ends and storing them until enough are present for efficient extraction would likely lead to spoiling in warmer climates (Outram 2001: 402).

Figure 5.44 shows the fragmentation for the three size classes of major food mammals. In all three categories, end+ shaft splinters predominate, especially among the medium (pig-sized) and largest (cow-sized) groups. The next largest category is shaft splinters, also typical of a marrow processing strategy (Binford 1978: 154).

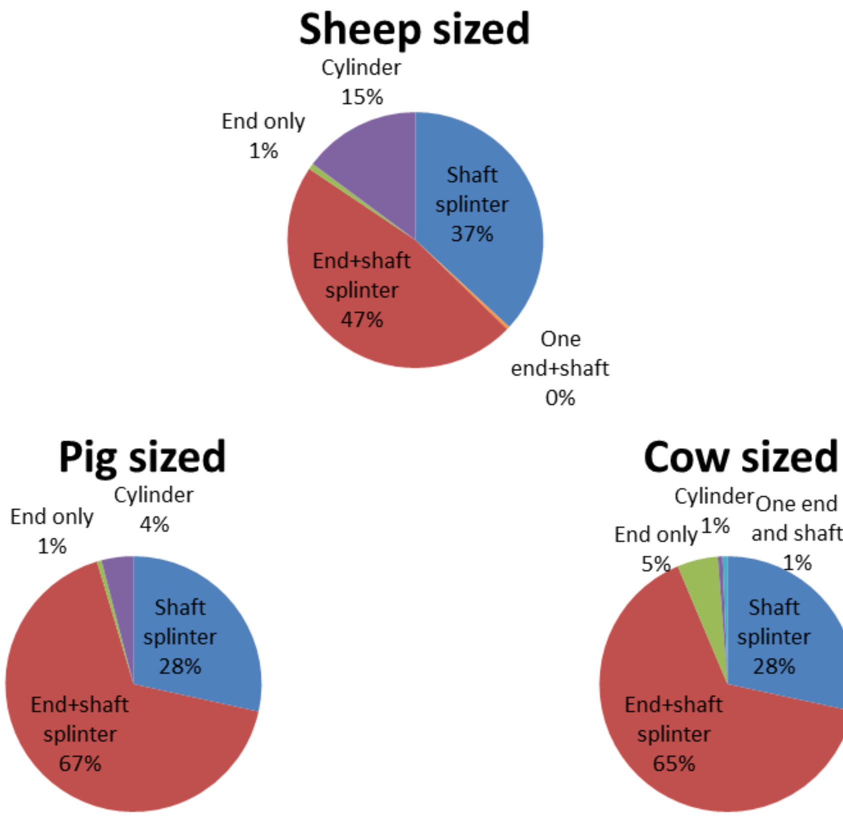

Figure 5. 44. Long bone fragmentation by size class.

Both Outram and Stiner have argued for the importance of marrow and grease extraction in hunting societies as a strategy to counter dietary stress, but unfortunately neither addresses the very real possibility that mixed farmers also processed bones for marrow and grease. Rather than seeing it as an attempt to get more calories from a carcass, we might imagine that breaking bones for marrow, especially in the context of feasting, is more a cultural preference; a way of getting all the flavor out of the animal bones. If Halstead's observation for the Greek Neolithic—that mixed farmers very rarely ate meat—holds true for other Neolithic societies, (as Dennell (1978) has argued for southern Bulgaria) than succulent bone marrow may have been a treasured commodity.

Post- depositional processes also affected the assemblage. As discussed in the last section, the most destructive of these was density mediated attrition. Therefore, at this time I would suggest that the high degree of fragmentation of the assemblage at Sarnevo is largely a result of human agency. The bones were most likely cracked open for their marrow but may have also been chopped up into smaller segments for cooking inside vessels (as at Neolithic Opovo, Russell 1993: 367), although chop marks were indeed rare on specimens. The assemblage was further affected by density mediated processes after deposition (with additional factors such as sediment compaction no doubt playing some role), and damaged extensively during recovery and transport to the laboratory.

Body part representation among the scrap fragments is presented in Figure5.35. When the entire site is examined together, long bone scrap is the most abundant, at 41%, followed closely by rib scrap. When the body parts are broken down by size class, we see that among the small and medium sized animals long bone scrap is still predominant, with rib scrap also being well represented. Among the large size animals, however, rib scrap is slightly more abundant than long bone scrap. Vertebral scrap is well represented among medium and large-bodied species, and less so among the smaller species.

Ribs and axial portions of the skeleton can be very meaty, especially in larger species, so their presence among feasting remains is not surprising. Axial parts of the carcass can be divided up and shared just as easily as limb bones. Long bone scrap may be more numerous because the bones were more heavily processed for marrow/ bone grease, although axial elements may also be used to extract a different type of bone grease (Binford 1978, Outram 2001).

As the body part analysis for numerous taxa discussed earlier shows, mostly intact carcasses were available for consumption at Sarnevo. If the majority of the scrap comes from domestic animals (as it probably does), then they were most likely butchered on site, and probably sacrificed. Presumably wild animals were not slaughtered on site, but rather transported from the kill site. However, the body part profiles suggest that for deer, much of the carcass was being brought back to the site. Although it should be reiterated that the earlier calculations do not take into account axial elements other than the atlas, axis, and sacrum, one still gets the impression that most of the hunted carcasses were present at Sarnevo.

5.8 Butchery patterns

The analysis of butchery marks on animal bones can yield a great deal of information about the manner of dismemberment and distribution of carcasses, critical components to an interpretation of a feasting assemblage. Cut mark analysis may give insight into how intensely carcasses were divided or the manner in which meat was prepared for cooking (filleting raw vs. carving up roasted joints; Halstead 2007: 29). Three types of marks were identified during analysis: cuts, scrapes, and chops. Cuts are by far the most abundant type of mark, as scrapes accounted for only 6 specimens (5 DZ) and chop marks only 2.

There are a number of issues involved in the quantification and interpretation of cut marks at Sarnevo. Fist is the appropriate method of quantification. Many analysts use the %NISPcut, which is the ratio of cut to uncut specimens in the assemblage. Otarola-Castillo explored changes to the ratio of cut to uncut fragments in highly fragmented assemblages, coming to the conclusion that "NISP can be an inconsistent estimator of true cut mark patterns after heavy fragmentation", due to an exponentially increasing ratio of uncut fragments to cut fragments as a collection becomes more and more fragmented (2010: 9).

Clearly this is an issue at Sarnevo. Otarola-Castillo recommended using a different measure of quantification, %cMNEcut, which was derived after conjoining as many skeletal fragments as possible (cMNE) in order to obtain a more accurate count of elements present at the time of deposition. In his view, this ameliorated the drastic increase in the ratio of uncut to cut fragments when calculated by NISP alone (Ibid.).

The cMNE was not calculated during analysis at Sarnevo, but quantifying cut marks by diagnostic zones should serve roughly the same purpose, although, like the cMNE, it severely reduces sample size. I present the %NISPcut alongside the %DZcut in order to examine the relationship between these two variables for the material at Sarnevo.

Table 5. 6. Quantification of cut marks on the faunal assemblage.

Total NISP	Total DZ	NISPcut	DZcut	%NISPcut	%Dzcut
4009	1361.5	88	43	0.809121	3.158281

The difference in the percentage of cut marks on specimens when quantified by %NISPcut and %DZcut is noteworthy. When quantified by NISP, the ratio of cut to uncut is less than 1%: when quantified by DZ, it's over 3%. Either way, very little of the assemblage is actually characterized by cut marks. This is not surprising, since cutting joints and meat does not always leave traces on the bone (Halstead 2007: 29-30)

The majority (NISP=44, DZ=25) of the cut marks were located on long bone fragments. 2.1% of the total long bone NISP displayed cut marks; 2.9% when grouped by DZ (Table 5.12).

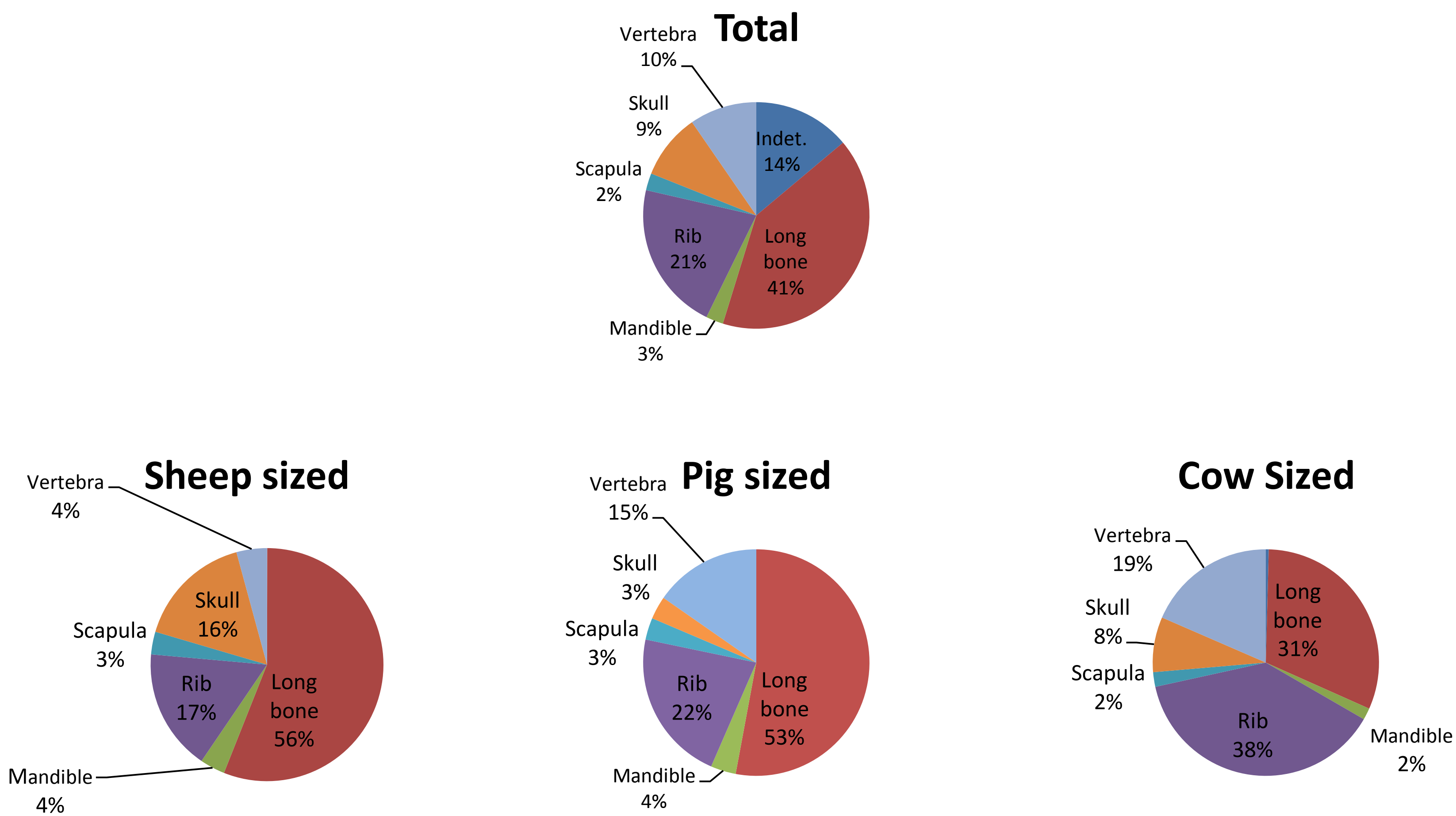

Figure 5.45. Scrap fragments grouped into body zones

Table 5. 7. Cut mark frequency on long bones

NISP	DZ		%NISPcut	%Dzcut
2036	852		2.1611	2.934272

When location of the cut marks on long bone fragments is considered, the method of quantification again plays a role in determining the proportion of cut marks on either the articular ends of the element or the shaft fragments, shown in Table 5.13:

Table 5. 8. Location of cut marks on long bone fragments.

		NISPcut	Dzcut		%NISPcut	%Dzcut
Articular ends		21	15		47.72727	60
Shaft		23	10		52.27273	40

Marks located on the articular ends are most often related to dismemberment and disarticulation (Binford 1978,1981), whereas those on shaft fragments are related to filleting and de-fleshing (see also Lyman 1987). 60% of the long bone fragments have traces of butchery on their articular ends, although when quantified by NISP this proportion is more equitable, and is actually higher for shaft fragments. Either way, it is clear that the cut marks on the long bones at Sarnevo do represent a range of butchery practices from initial dismemberment to filleting and de-fleshing.

The frequencies of cut marks on carcasses of various sizes may give an indication of the intensity to which the carcass was butchered. For example, if larger carcasses were observed to have fewer cut marks, one could argue that they were exploited more wastefully, a possible sign of consumption during feasts (Halstead 2007: 30).

Figure 5.45 shows the occurrence of cut marks on carcasses of the three size classes. Cut marks were much more frequently observed on elements from large carcasses than on either medium or small. Although small sample size (NISP=84) precludes a strong assertion that larger animals were butchered more intensively than smaller ones, there is the possibility that, because of their size, larger animals were subject to sharing out in greater portions, and thus to intensive butchery. This should not be taken as an argument against commensality, as I have argued earlier that intensely processed carcasses does not negate feasting. The fact remains that large carcasses cannot be consumed at anything smaller than the community level, and in the absence of reliable methods of storing (salt, vinegar, drying; see section 3), must have been either consumed by the community at commensal events or at the domestic level, though extensive meat sharing (Halstead 2007: 29).

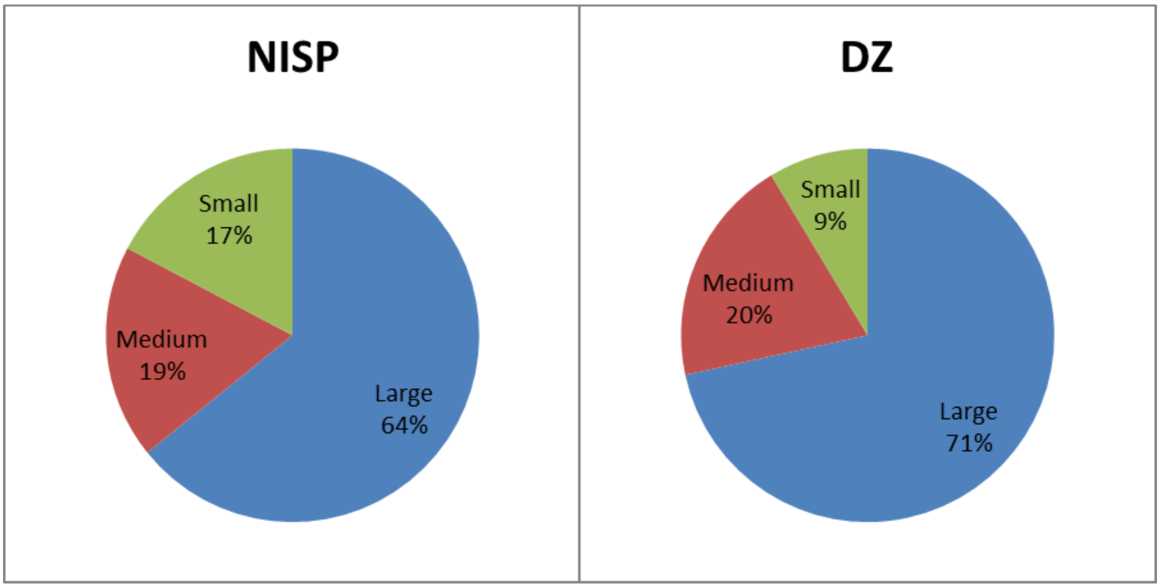

Figure 5. 46. Cut mark frequencies by size class.

A total of 13 cranial specimens exhibited cut marks (DZ=2), a figure too small for any meaningful statistics. A list of cranial elements with cut marks is presented in Table 5.14

Table 5. 9. Cranial specimens exhibiting cut marks.

GID	Element	Taxon	Comments
22.2.3	Mandible	Canis familiaris	4-5 vertical, parallel cut marks on the exterior portion of the mandible fragment, just below the distal portion of the p4/mesial portion of M1. Also exhibits brown burning on the bottom of the horiz. ramus
34.7.8	Skull	Sheep-size (medium dog to medium sheep)	5 very light, parallel and long (17mm) cut marks on the parietal portion of the cranial fragment.
34.19.16	Skull	Cow-size (cattle/red deer/horse)	5 long cut marks on the cranial fragment. The fragment itself cannot be Id'd to region of the skull
63.3.7	Mandible	Bos taurus	4 cut marks on the posterior end of the diastema, just beneath the alveolus of p2.
66.23.11	Skull	Bos taurus	On the frontal bone of this specimen, roughly 35mm anterior of the base of the right horn core, are numerous (at least 11) light, cirss-crossing marks. Indicative of skinning?
72.10.6	Mandible	Bos taurus	3 very light cut marks running A-P on the lateral side of the ascending ramus.
10020.1.4	Mandible	Large artiodactyl	3 long (15mm) parallel cut marks on the lateral side of the mandible fragment, directly under the coronoid process on the ascending ramus.
10025.4.52	Skull	Medium artiodactyl	3 light cut marks on the bassioccipital part of the skull fragment.
10530.2.9	Mandible	Bos taurus	3 light, small cut marks just below the coronoid on the posterior surface
11015.1.5	Mandible	Ovis/Capra/Capreolus	3 small parallel cut marks on the interior portion of the coronoid fragment

11015.1.133	Mandible	Bos taurus	3 medium depth, parallel cut marks on the posterior side of the fragment below cor. Proc.

The cranial cut marks include those noted for the *Bos* specimens earlier in this section, and also seem to suggest several practices, including skinning, disarticulation of the head, and possibly removal of the tongue.

The remainder of the cut marks (NISP=32, DZ=17) were distributed on rib fragments, carpals, tarsals, vertebrae, and pelvic fragments.

5.9 Cooking

309 fragments (92 DZs) preserved evidence of burning, most likely related to cooking. It is difficult to tell what the main method of cooking was at Sarnevo, although it is entirely possible that there were several. Bone fragments showed a relatively equal amount of exposure to high and low temperatures, with low temperature burning only slightly more prevalent (Figure 5.47). In general, bone burnt at lower temperatures usually turns a brownish black, whereas the complete destruction of the organic part of the bone results in a blue-greyish-white appearance (Gilchrist and Mytum 1986: 31). Where low temperature burning is present on the articular ends of longs bones but not the shaft, roasting is usually suggested (e.g Albarella and Serjeantson 2002: 42). Roasting is sometimes considered wasteful in terms of efficient nutrient extraction, and therefore an ideal method of preparation for wasteful, elaborate events like feasts. Recently, however, archaeologists have begun to question the legitimacy of this argument (Halstead 2007; Hamilakis and Harris 2011: 200; Russell 2012a: 389). Other methods of cooking (baking, boiling) may have been just as appropriate for feasts (e.g. Needham and Bowman 2005), and therefore, as with other classes of faunal data, we

should not search for a “feasting profile” of cooking techniques. The data at Sarnevo seem to corroborate this.

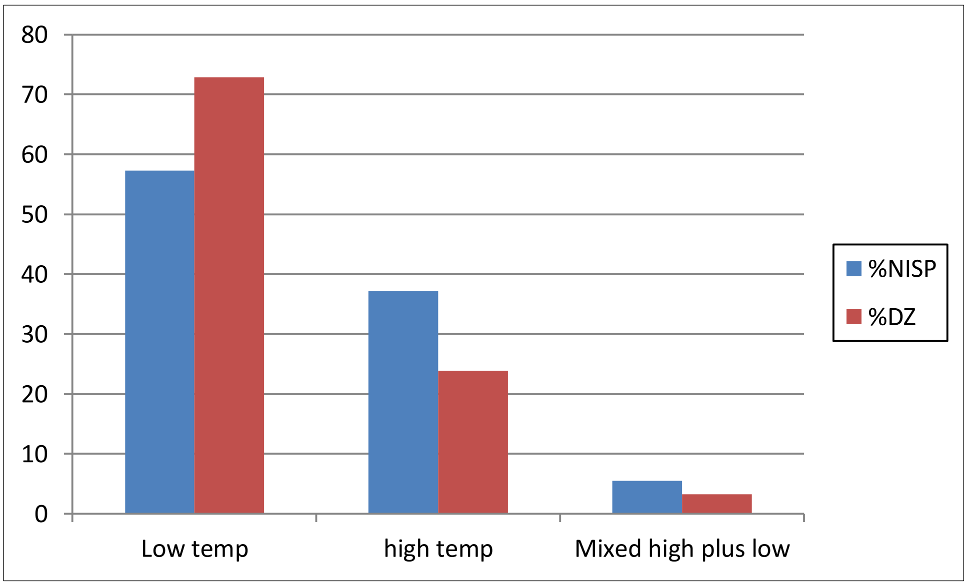

Figure 5.47. High vs. low temperature burning

There were only 28 definitive instances of roasting, where brownish-black (low temp) burning was observed on the articular ends of specimens but not on the shafts, mostly present on elements from the hindlimb (Figure 5.48). Although the sample is small, roasting primarily affected the bones of large and medium sized animals (15 and 11 instances, respectively, compared to only 2 for small animals). Though the tempting explanation is that joints from larger bodied species were reserved for roasting while those from smaller species were cooked in other ways, more data will need to be collected before this can be tested. The remainder of the possible cases for roasting cannot be truly evaluated because the articular end was not preserved together with the shaft for comparison. However, most bones do exhibit a brownish-black burning, indicating exposure to relatively low temperatures. They may have been exposed to open flames or baked in an oven.

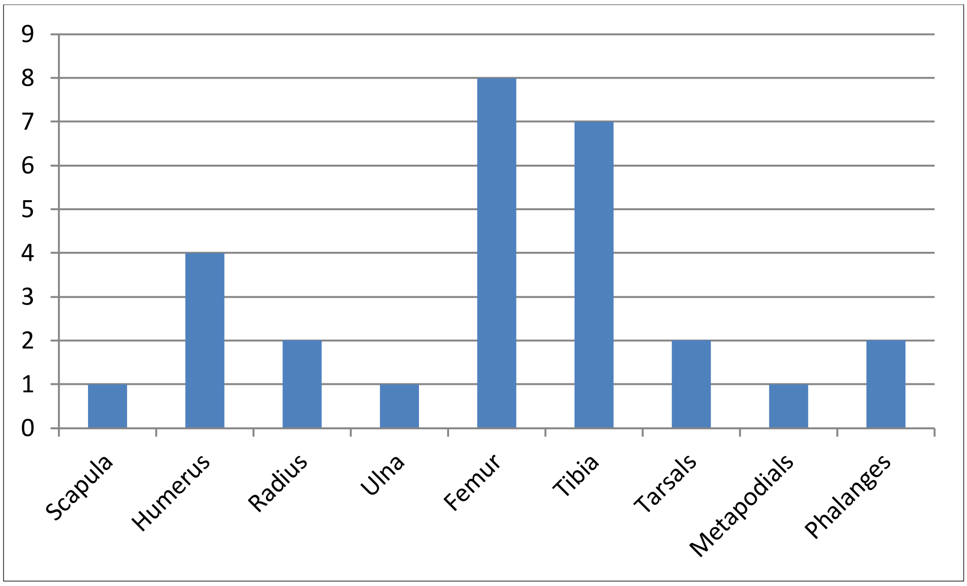

Figure 5.48. Instances of roasting observed on articular ends of bones

Another common type of burning is that intended to toast marrow and facilitate the breakage of the bone to extract it (Binford 1978: 152-154). This is usually typical on mandibles and metapodials (e.g. at Norpigeia-Drapanas; Hamilakis and Harris 2011: 210-211).At Sarnevo, there are 27 cases of mandibles that show burning for marrow roasting. Most belong to sheep/goat, although 10% of the pig mandibles recovered showed traces of this type of cooking. These fragments are always broken vertically across the horizontal ramus. The prevelance of burning on mandibles can be seen in Figure 5.49 , where instances of burning are shown for each element, grouped together into the three size classes.

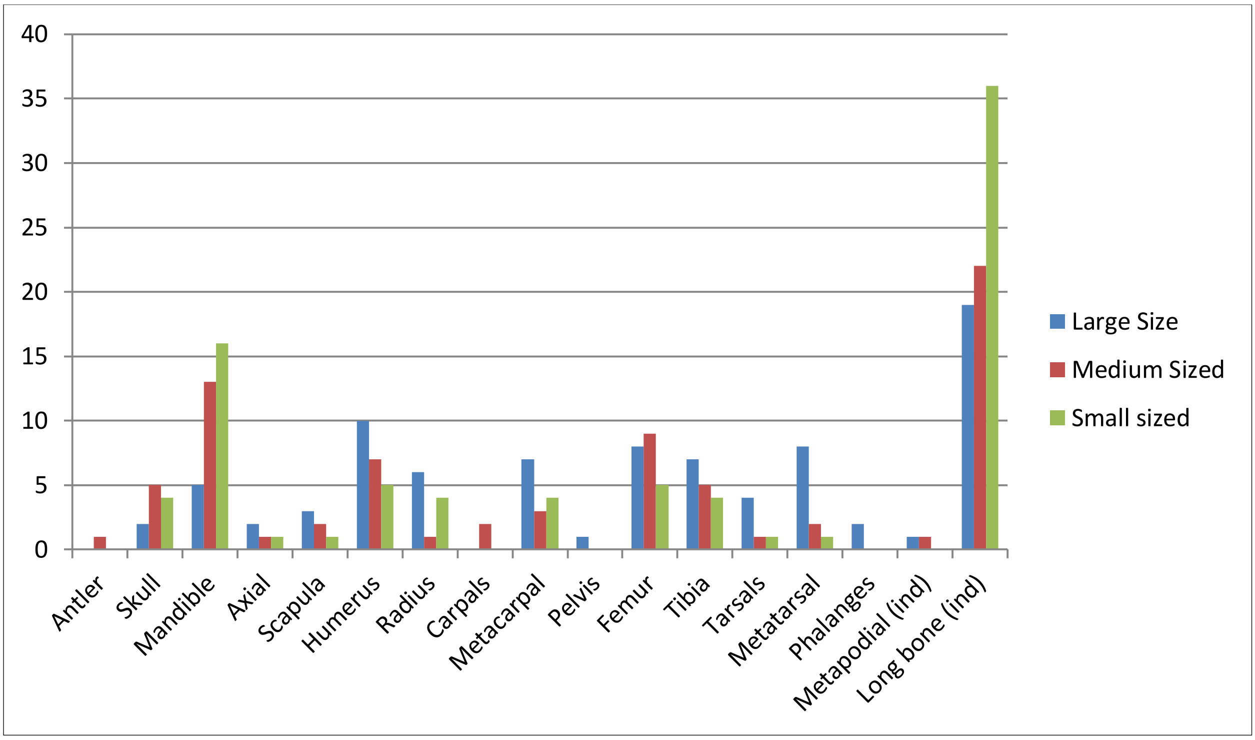

Figure 5. 49. Instances of burning on individual body parts for each of the three size classes

Burning seems to have affected more medium and small sized mandibles (the pig and sheep goat mostly), and not so much the larger animals. Other than mandibles, burning is relatively evenly distributed across elements of the upper limb and metapodials.

It is important to remember that cooking meat may leave no traces of burning on the animal bones at all. If the bones were wrapped in some other medium, like hide or dough, then they would have been relatively protected from thermal modification while they cooked. The burning analysis at Sarnevo seems to indicate that while roasting did indeed occur, other types of cooking were at least as prevalent.

6. Feature by feature analysis of the faunal materials

This section examines the faunal data from Sarnevo on a feature by feature basis, in order to identify any patterning in the deposition of the animal remains that might provide some insight into the characteristics of feasting at Late Neolithic Sarnevo. I examine the breakdown of the different taxa in the pits, the relative proportions of undiagnostic fragments in each, and the distribution of body parts throughout the features.

6.1 Pit Sites

Sarnevo is a pit site. It is characterized by large numbers (in all, over 70 just from the Late Neolithic) of pit features that were dug out in various ways. Pit features are a common occurrence on Neolithic and Copper Age sites all over Southeastern Europe. In form and content they are extremely variable, and must be discussed on a site by site basis (Chapman 2000a: 61, 82). When encountered in settlements, they are sometimes associated with certain structures such as houses, as was the case at Neolithic Opovo (Russell 1993), Gomolava, and Petnica (Orton 2008).

At this time, there seem to be three types of pit feature at Sarnevo. First, the most common are those with one interior deposit and a more or less oval shape. Examples would be Features 29, 62, and 66. Second are features like 9, 28, 34 and 73, which were described by the excavators as having multiple interior features. These are fewer in number but tend to be larger. Finally, there are the smallest features which have an almost spherical shape and diameters no larger than 1m. Karastoyanova (2011: 11) suggested that these pits belonged together in a group based on morphology, but could not say if they were used simultaneously (Figure 6.1).

Many of the features from the third group have been excluded from this study, because most were located outside of the predetermined study area. Small, spherical pits include Features

21, 73A-B, 99, 13G-H, 108A and 108B. The site map (Figure 1.4) shows that they have a wider distribution than the larger type of features, which are more tightly clustered together.

Figure 6. 1. Feature 99, one of the smaller, "type 3" features at Sarnevo. SW. (Bacvarov et al 2011:55)

According to the map, several of the larger feastures, like 34, 38, or 72 were separated into additional, smaller “sub-features” (for example, in Feature 34 there are 7: Figure 6.2). The animal remains recovered were rarely separated by these groupings. The tags included in the bags of animal remains simply read “Feature 28”, or “Feature 34”, and not “Feature 28B” or “Feature 34C”.

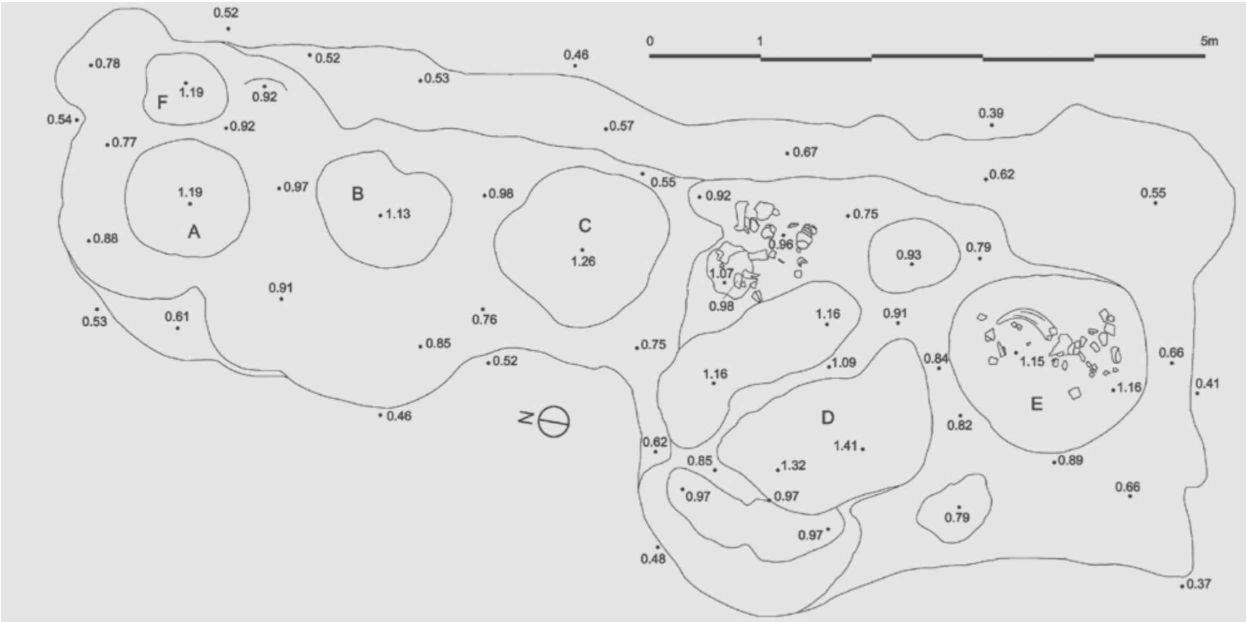

Figure 6. 2. Feature 34, Planview showing multiple interior deposits. East. (Bacvarov et al 2011: 54)

Where this was the case, the animal remains from these features were out of necessity analyzed together. The exceptions were Features 72 and 73, which were separated by their sub-groupings.

There are usually two arguments about pits from sites such as Sarnevo or Hadjidimitrovo (section 1): that they are pit houses (*zemlyanki)* or garbage dumps (*bokluchni yami)*. The largest features, such as 9 or 34, would seem to be ideal candidates for pit houses, since they are large and contain high amounts of animal bones, ceramics, and broken grinding stones, and are capped with burnt debris from what are most likely structures. However, their sharply oblique walls and uneven bottoms seem to suggest that they did not function as a residence (Ibid.).

Their use as garbage pits might seem more plausible, given the high concentrations and extremely fragmented nature of the artifacts just mentioned. The problem is that garbage (or rubbish) is a relatively modern concept and one that is not likely to have been held by prehistoric communities. Chapman's analysis of pits from prehistoric sites in SE and Central Europe led him to conclude that far from being a casual removal of material from the realm of the "living", deliberate deposition in pits at settlements served as a way for communities to maintain a close association with the ancestors who left their remains in the same spots (Chapman 2000a: 62).

Chapman only covered two types of pits: those excavated into the "virgin" soil and those whose construction resulted in the mixing of old and new material remains. But he only discussed pits in the context of settlements. It might be possible to extend his arguments about patterns of deposition to the pits at Sarnevo. Since they were filled in over a period of at least 200 years there seems to be a similar concern with depositing where the ancestors did. This is not to deny the very real problem, discussed in section 3, of disposing of large amounts of refuse that will quickly become offensive to the senses and bring unwanted pests. Feasting remains have both "physical and symbolic pollution" (Douglass 1966, cited in Chapman 2000; Russell 2012a: 390.).

What's clear from the evidence at Sarnevo is that the pits were originally constructed for other purposes, although with their function as repositories probably in mind. According to Karastoyanova, every one of the larger pits (of the first two types described) pits featured at least one working surface, identified by a layer of clean clay plastered over the bottom of the feature, and fragments of grinding stones which were intentionally broken. Their ubiquitous presence suggested to her that they were a "mandatory part of the ritual" (Ibid.: 13). In addition to the grinding stone fragments, two features contained hearths (Tonkova, et al 2008: 163; Karastoyanova 2011: 10).

Much of Feature 9 was filled in with clay that was left over from its construction, indicating that it was perhaps not in use for very long. The radiocarbon dates give a range of87 years, but since the pit is divided into two major parts, it is difficult to tell the exact amount of time any one part of the feature was in use (Karastoyanova 2011: 15).

Based on this evidence I can offer a tentative explanation of these first two types of pits. I propose that they were originally dug out to provide working spaces for the preparation of large feasts. As noted in section 3, preparation for feasts on a large-scale often requires special ‘on-site’ facilities to accommodate the preparation of such copious amounts of food and drink. The grinding stones and hearths were indeed “mandatory to the ritual”, or at least to its preparation, and for that reason they were buried in the pit along with the rest of the feasting debris. The pits provided not only viable working spaces for grinding cereal and processing animal carcasses, but after the fact provided a convenient location to seal away the large amounts of trash.

It’s tempting, then, to imagine that each pit belongs to a discrete group, such as a household, since the responsibility for feast preparation usually falls to one or more households, depending on who is organizing the feasts, as is the case among the Luo of East Africa (Dietler 2001). Since there are no associations of pit features with other structures, such as houses, I avoid making such assumptions at this point. Even when pits can be clearly associated with a house or structure, as was the case at Neolithic Opovo, it is still difficult to argue that the pit was in use by that household, or even by only one household at all (Russell 1993: 452).

6.2 Species representation:diagnostic fragments

The first thing to look for is any meaningful difference in species representations in the pits, , in order to see if there was any differential access to certain taxa that may have been restricted as special feasting foods available only to some.

Figure 6.1 shows the proportion of diagnostic zones for the major food mammals for 19 of the 31 features studied. Features with fewer than 10 diagnostic zones total were excluded from the analysis because they were unlikely to provide meaningful results.. The features show a typical species distribution (Russell 1993: 438), where for the most part each pit looks like the site as a whole. Cattle and fallow deer usually predominate while pigs, sheep/goat and other cervids are less abundant.

There are some exceptions to this general pattern. Feature 73B contains nearly 70% sheep/goats, with cattle being the least abundant. In some features cattle are much more predominant than other species, such as Features 62, 71, and 53, where they make up close to or over 50% of the diagnostic zones. In Feature 57, 52% of the diagnostic zones are from sheep and goats. In some features, such as 42, 65, 72 and 81, fallow deer make up a higher proportion than other taxa, including cattle.

Feature 21 is also of interest. Located on the left margins of the primary pit groupings, it was the few small pit of its type to produce more than ten diagnostic zones. The results show that most of the remains are from small-bodied taxa: mostly sheep/goat and a much higher proportion of roe deer than other features. There are no DZs from medium bodied animals (although there are 2 undiagnostic fragments, Figure 6.2). What few DZs are present from cattle are all metapodials. It is unfortunate that the other pits like it could not be compared. Perhaps those who filled in this pit had limited or no access to large amounts of meat from large species or perhaps they had a completely different function than their larger cousins.

In Feature 66, the feature with the highest number of diagnostic zones and presumably the best representative sample, fallow deer and domestic cattle are the most abundant species. Pig, caprines, aurochs, and other cervids never comprise more than 15% of the diagnostic zones (and in fact most comprise only 1%).

From Figure 6.1 we also get a sense of the distribution of wild or domestic taxa in each of the features. Domestic animals and especially cattle are the most abundant, but not overwhelmingly so. The high proportion of wild species, and especially fallow deer, is apparent. In 8 of the features they are the most abundant taxon. However, only in 4 features does the total number of DZs from wild animals add up to more than that from domestic ones. What is interesting is that, for the most part, all other wild animals (red and roe deer, aurochs) never add up to the amount of fallow deer at the site. Sharing the meat of wild animals seems to have been carried out on the same scale as domestic meat.

Therefore it seems that all species, both wild and domestic, were evenly distributed throughout the different types of pits at Sarnevo, except for those in the third group, the small circular pits. Of these, only two were in the study area and produced enough DZs to be compared: Feature 21 and 73B. In both cases small taxa predominate, with larger ones present but in very small numbers.

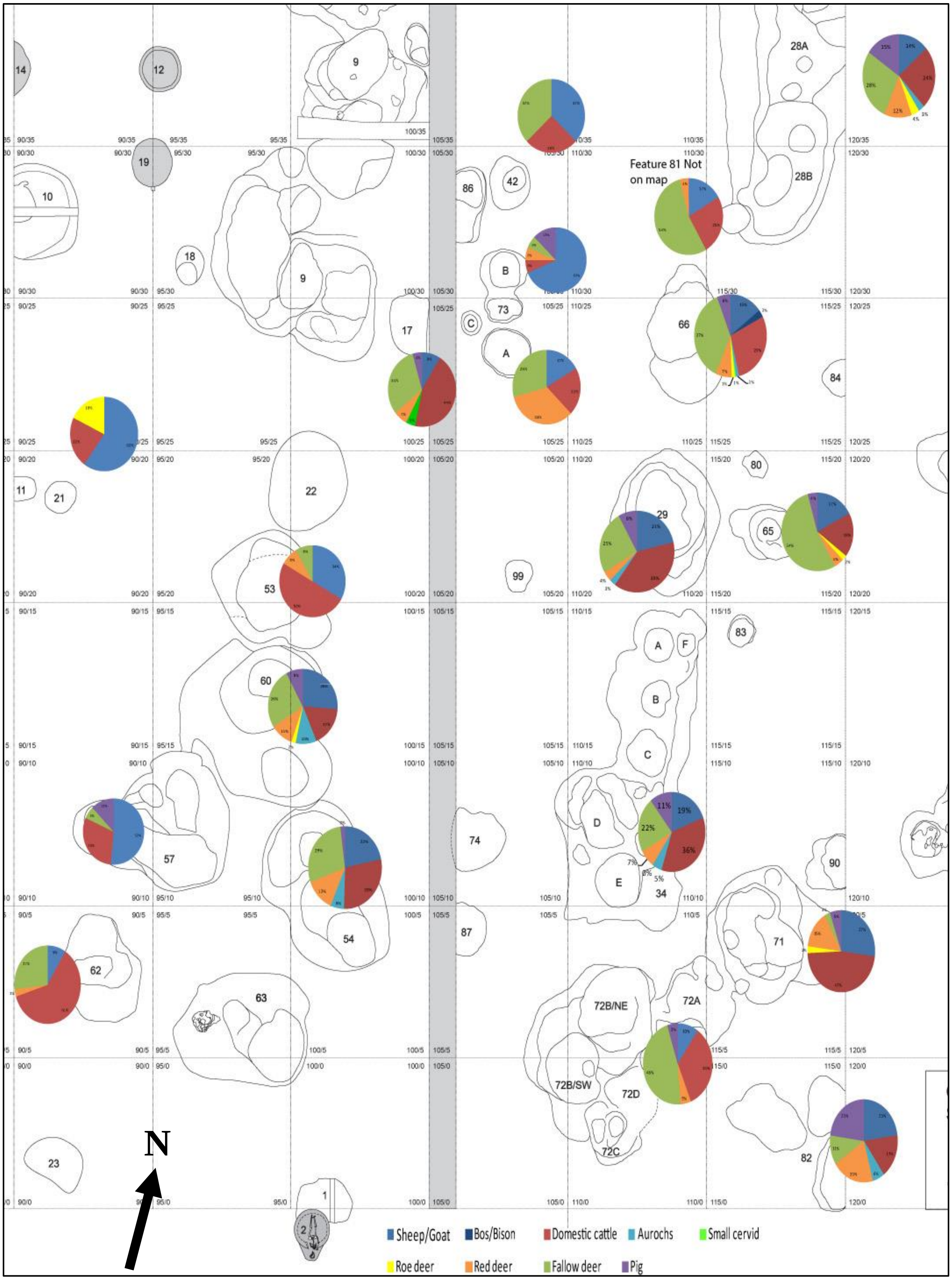

Figure 6. 3 Relative abundance of major food mammals by feature, % DZ, where DZ≥10. Grid is 5x5m.

6.3 Species representation:undiagnostic fragments

The majority of the faunal remains from Sarnevo were undiagnostic, and were grouped together according the “scrap” categories described in section 4. Figure 6.2 presents the proportion of large, medium, and small-bodied scrap fragments for 17 of the 31 features studied. Features with fewer than 50 fragments were excluded from the analysis, as were fragments that only showed recent breaks. Analyzing the scrap fragments for each feature is considered here a tentative measure of the relative abundance of large, medium, or small-bodied taxa deposited in the pits.

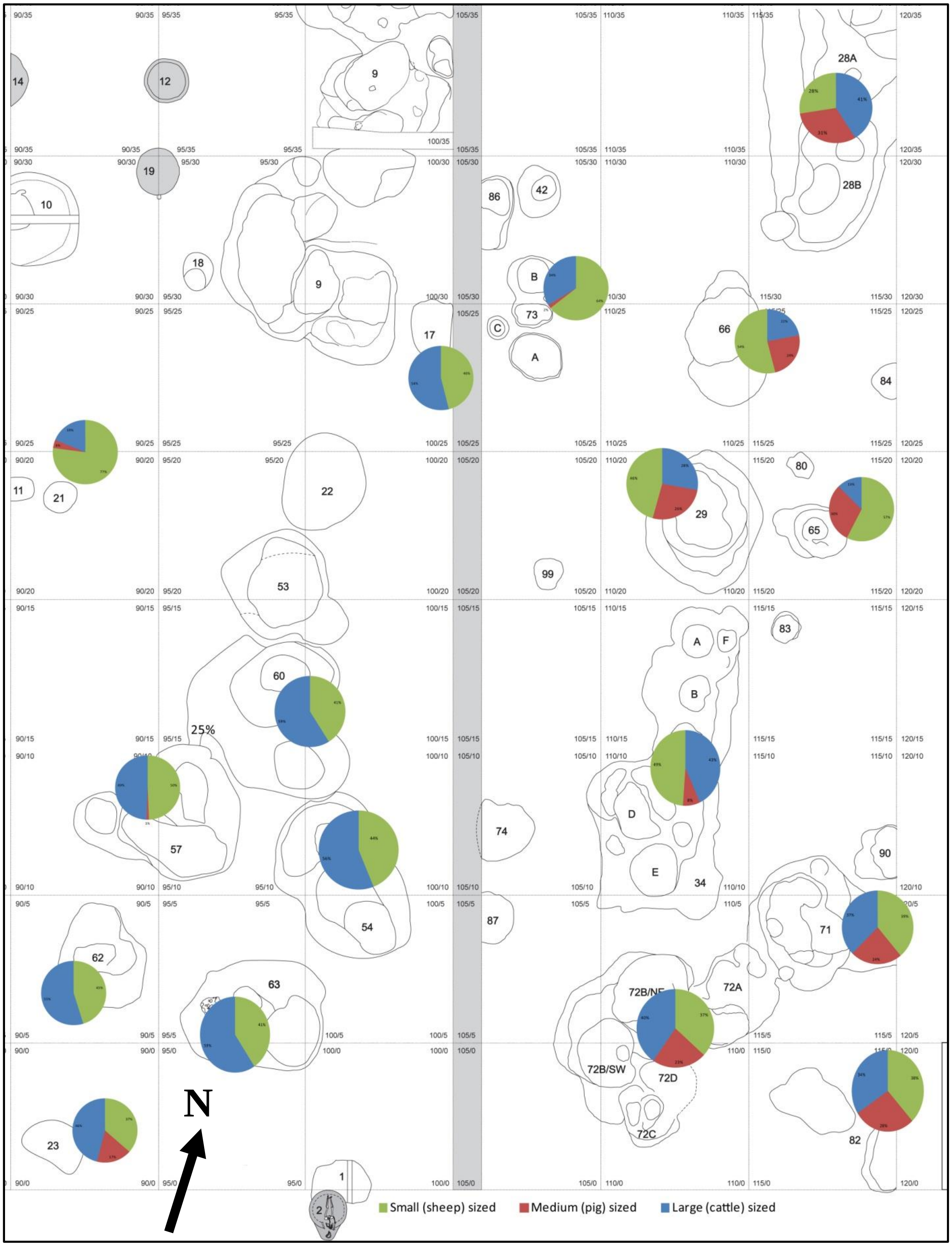

Figure 6. 4. Proportion of large, medium, and small-bodied "scrap" by feature. Grid is 5x5 m

The first thing that stands out is the lack of medium sized scrap in comparison to large and small. This includes scrap from pigs and fallow deer and one would expect, given the high proportion of fallow deer, that medium sized scrap would be more abundant.

There are a few possible explanations. First is the initial difficulty the recorder experienced when trying to determine how to properly assign scrap categories. Very large and very small scrap was easily separated, but there were many intermediate specimens which were difficult to assess. With time and experience this became easier, and medium sized scrap fragments were most likely recognized with increasing frequency as the analysis went on.

The second possibility is that medium sized scrap may look like small sized scrap if the animal was not fully grown. As show in section 5, especially for the pigs, there were a high proportion of juvenile animals. When highly fragmented, these may easily be attributed to the small size category.

Despite these problems, it is clear that large and small sized scrap were more abundant in the pits at Sarnevo. In figure 6.2. the pits on the left side generally show more large scrap than small, whereas on the right-hand side there is a more even distribution, with many features actually having more small-bodied scrap.

The proportions of undiagnostic fragments again show that there seems to be an overall parity in the distribution of species across the site and through time. There are no pits which show an overwhelming percentage of large, medium, or small-bodied scrap. However, in feature 73B and Feature 21, we see a correspondingly high amount of small-bodied scrap, which suggests that we may truly be seeing a patterned deposition of small taxa in these pits that is not apparent in the others.

6.4 Body part distribution

For each of the 19 features which had more than 10 total diagnostic zones, the breakdown of body parts is presented in Figures 6.5-6.24, again expressed as a percentage of expected diagnostic zones for intact carcasses. The figures only take into account mandibles, axis, atlas, sacrum, acetabulum and all elements of the fore and hind limbs down to and including the metapodials. This reduces the number of total diagnostic zones since elements from the extremities (phalanges) are not included. These elements have little to no meat on them and are most likely present in the pits because they were originally attached as 'riders' to larger sections of carcasses (Binford 1978).

Normally one would calculate the body part distribution for each identifiable taxon in each feature. This would have produced a much greater number of tables and since some taxa are absent in some features, would have resulted in a confusing set of graphics. Instead, the body part distribution was calculated for large sized (cattle, both wild and domestic, red deer, and specimens of the 'large' size class), medium sized (pig or fallow deer sized, and specimens of the 'medium' size class), and small sized (sheep, goat, roe deer, and specimens of the 'small' size class) carcasses. This assumes that the carcasses of wild and domestic animals and animals in the same body size were distributed in similar ways. This assumption relies on the previously argued increasing value of larger taxa compared to smaller ones, outlined in section 2 and 3.

There do not seem to be any real differences in the body part distribution for the individual size classes in the features at Sarnevo. There are some features, like Feature 17, which show a higher proportion of fore to hind limb elements, but this could be the result of small sample size.

Feature 53 also has a high proportion of mandibles for small and large size classes and very little in the way of postcranial elements.

Feature 62 seems to have an absence of DZ from smaller bodied taxa, and the species representation for this pit shows cattle at 61% of total DZs. Similarly, large-bodied scrap comprised 55% of the total undiagnostic material whereas small sized scrap comprised 45%.

Again, looking at Feature 66, with the highest sample size, we see that there is a much more even distribution of body parts, especially among the large and medium bodied taxa. Hindlimb elements seem to be lacking among the small size class. In short, there seems to be no strong depositional patterning of faunal remains at Sarnevo. Carcasses seem to have been divided up and distributed relatively evenly throughout the entire period that Sarnevo was in use.

The division and sharing of animal carcasses is an important part of commensality among mixed farmers as well as hunter-gatherers. Oftentimes elements from the same individual end up in different contexts , and one could attempt to pair match between the pits in order to investigate the patterns of meat sharing. Two factors prevented such an analysis for the pits at Sarnevo.

The first was time constraints. Pair matching is extremely time consuming and some argue not very productive (White 1953, cited in O'Connor 2000: 58). With highly it becomes infinitely more difficult. Second, given the high volume of faunal remains, there simply was not enough space to lay out every feature simultaneously in the lab.

Pair matching could have immense benefits at Sarnevo. As mentioned earlier, the associations between the pits and household, kin, and/or corporate groups at the site is not clear. Since we know that meat sharing indeed occurs among farmers just as it does for hunter-gatherers, identifying parts of the same carcass in different pits might solidify the link between pits and groups of individuals. In fact such an analysis is underway at the time of writing by P. Zidarov of New Bulgarian University and will be included in the site volume.

That said, small adjacent features and features with more than one deposit (72 and73) were laid out together at the time of recording and an attempt was made at pair matching. Feature 72 yielded no such matches, but Feature 73 was a bit more promising.

The analysis revealed that some elements were in fact distributed among the smaller pits that made up Feature 73. In one case, the right and left acetabuli from the same individual, a *Bos taurus*, were split and placed in separate pits (73A and 73B). Another, though less certain, was a red deer humerus and femur which were recovered from feature 73B and the surrounding feature 73. Finally, a sheep/goat maxilla with teeth seems to have been split into its right and left halves and placed into two separate sub features (73 and 73B).

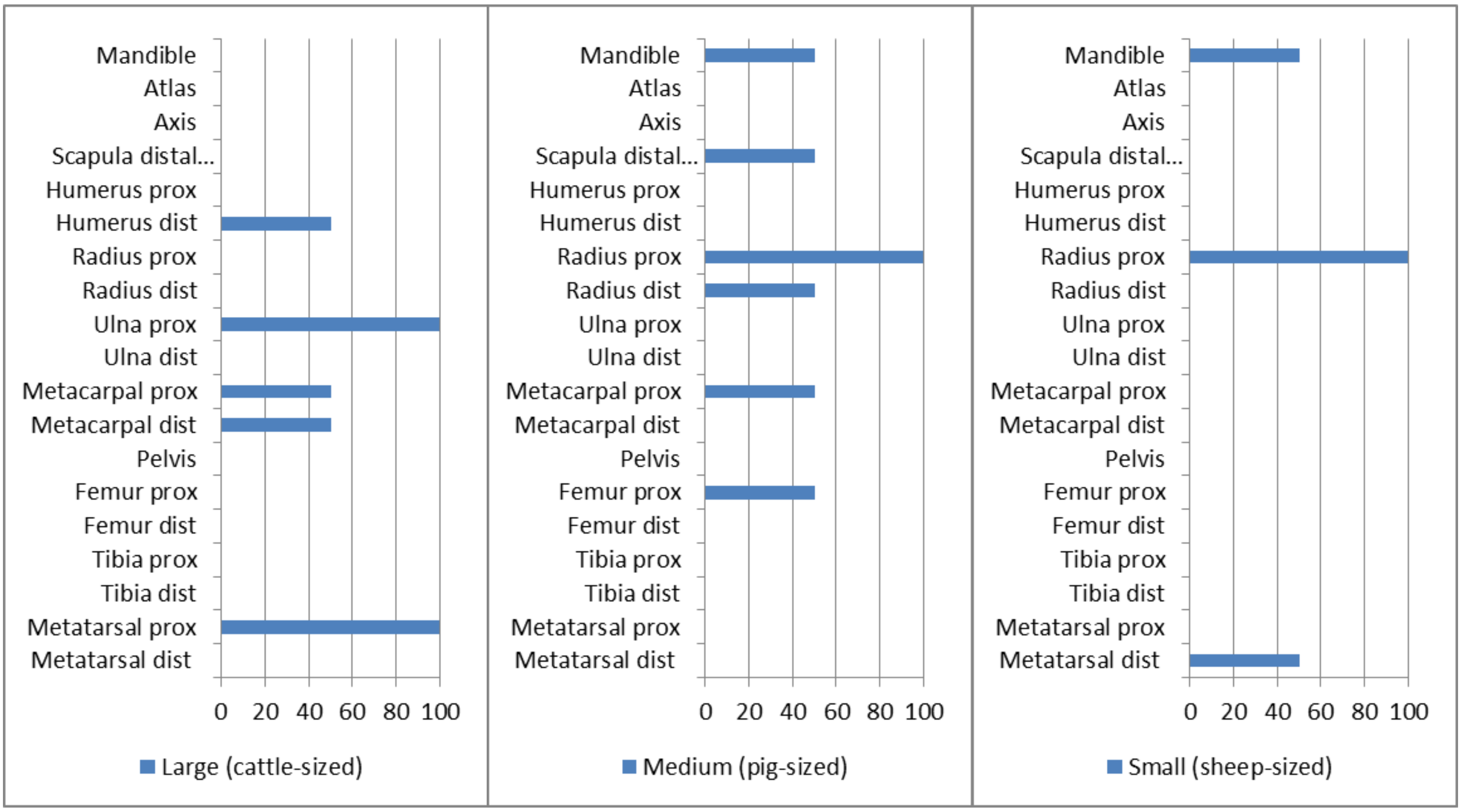

Figure 6. 5. Feature 17

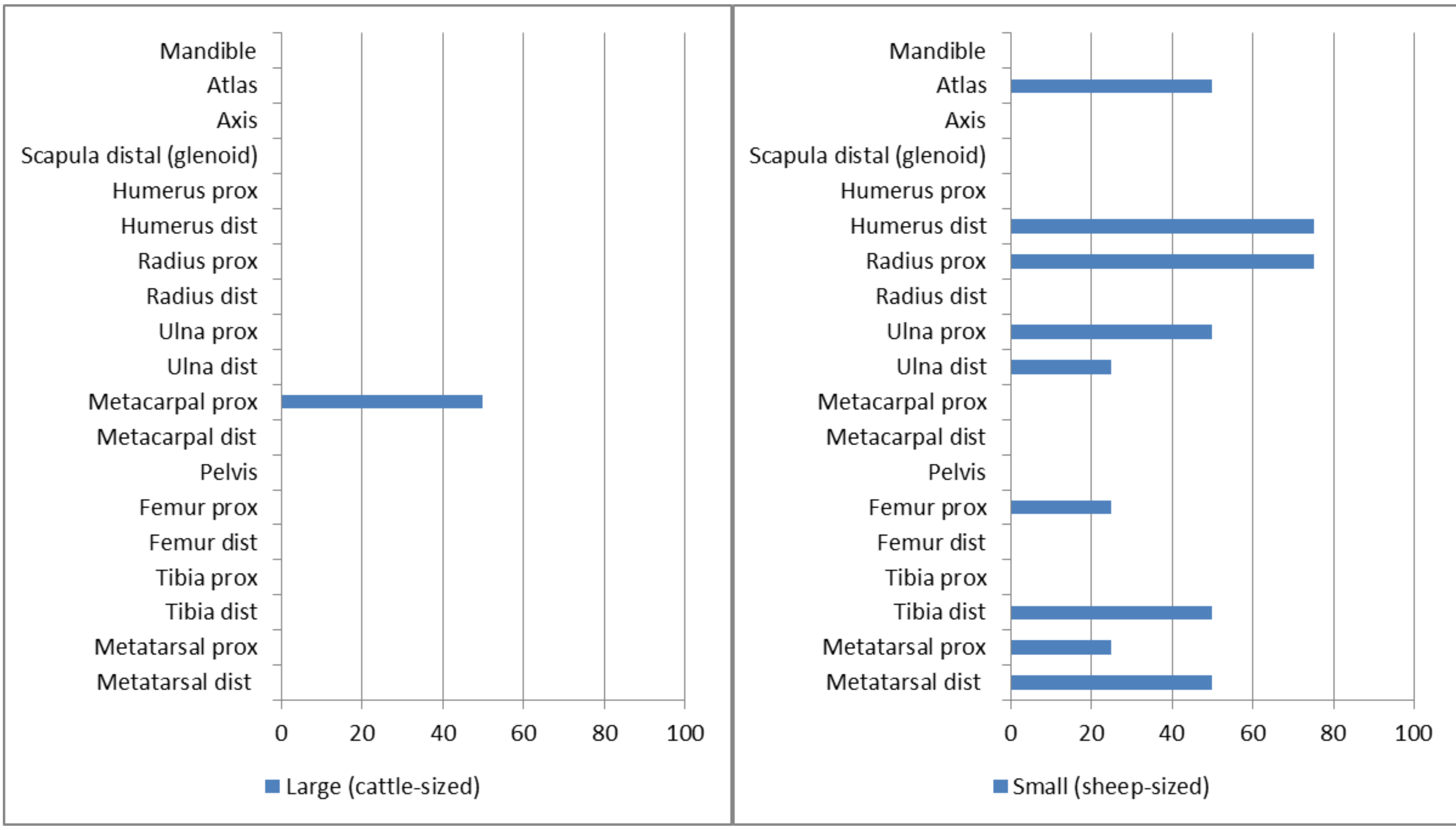

Figure 6. 6. Feature 21

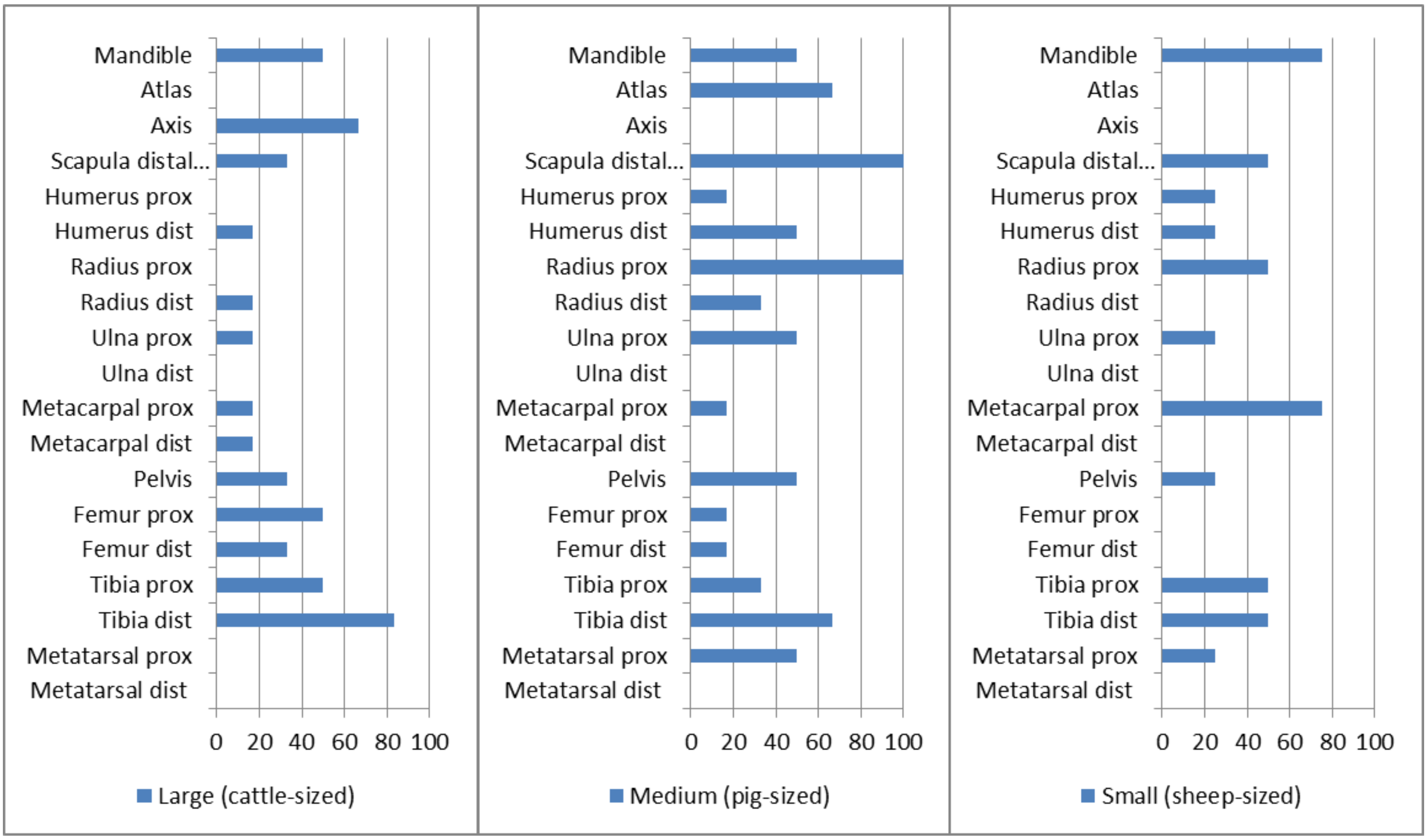

Figure. 6. 7. Feature 28

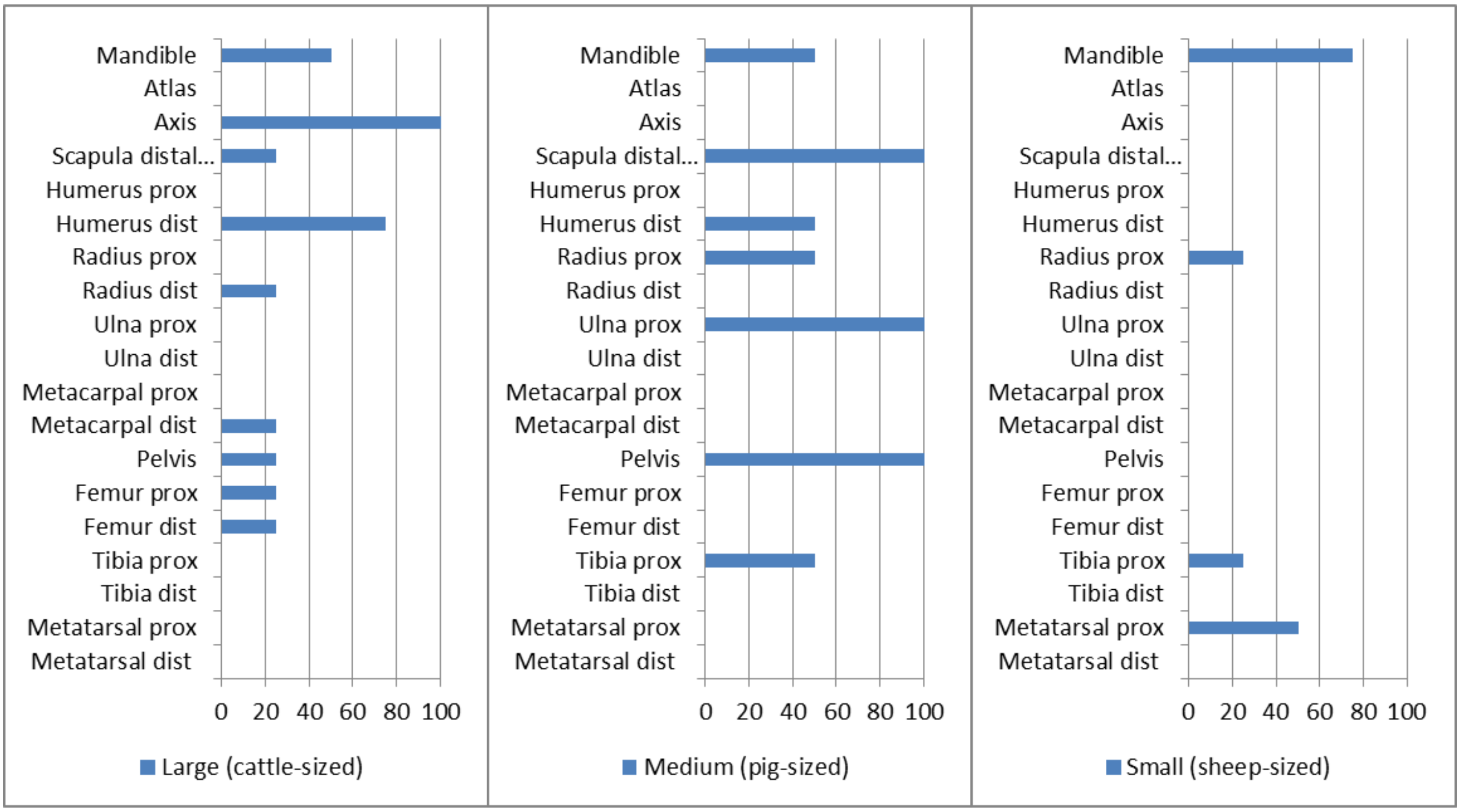

Figure. 6. 8. Feature 29

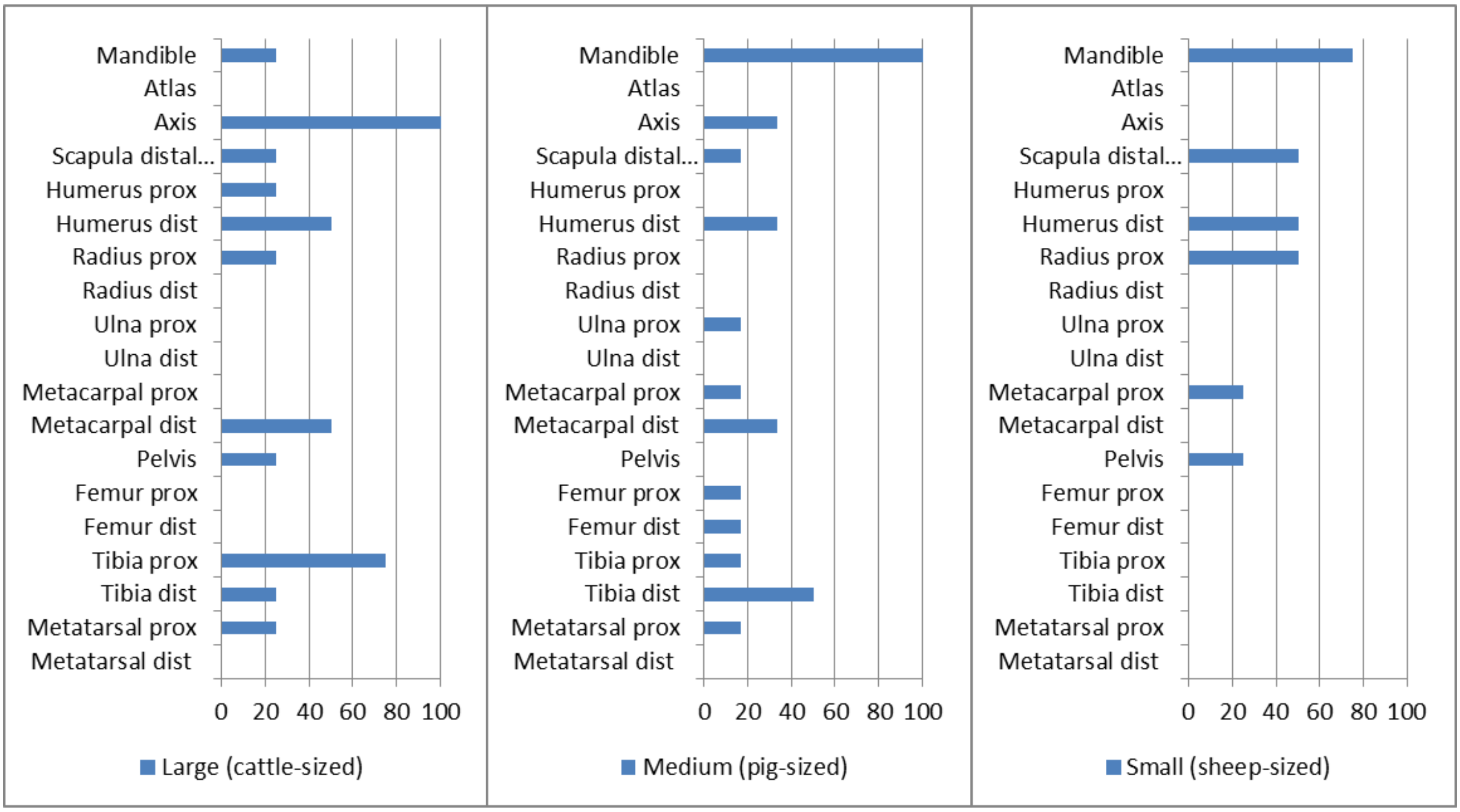

Figure 6.9. Feature 34

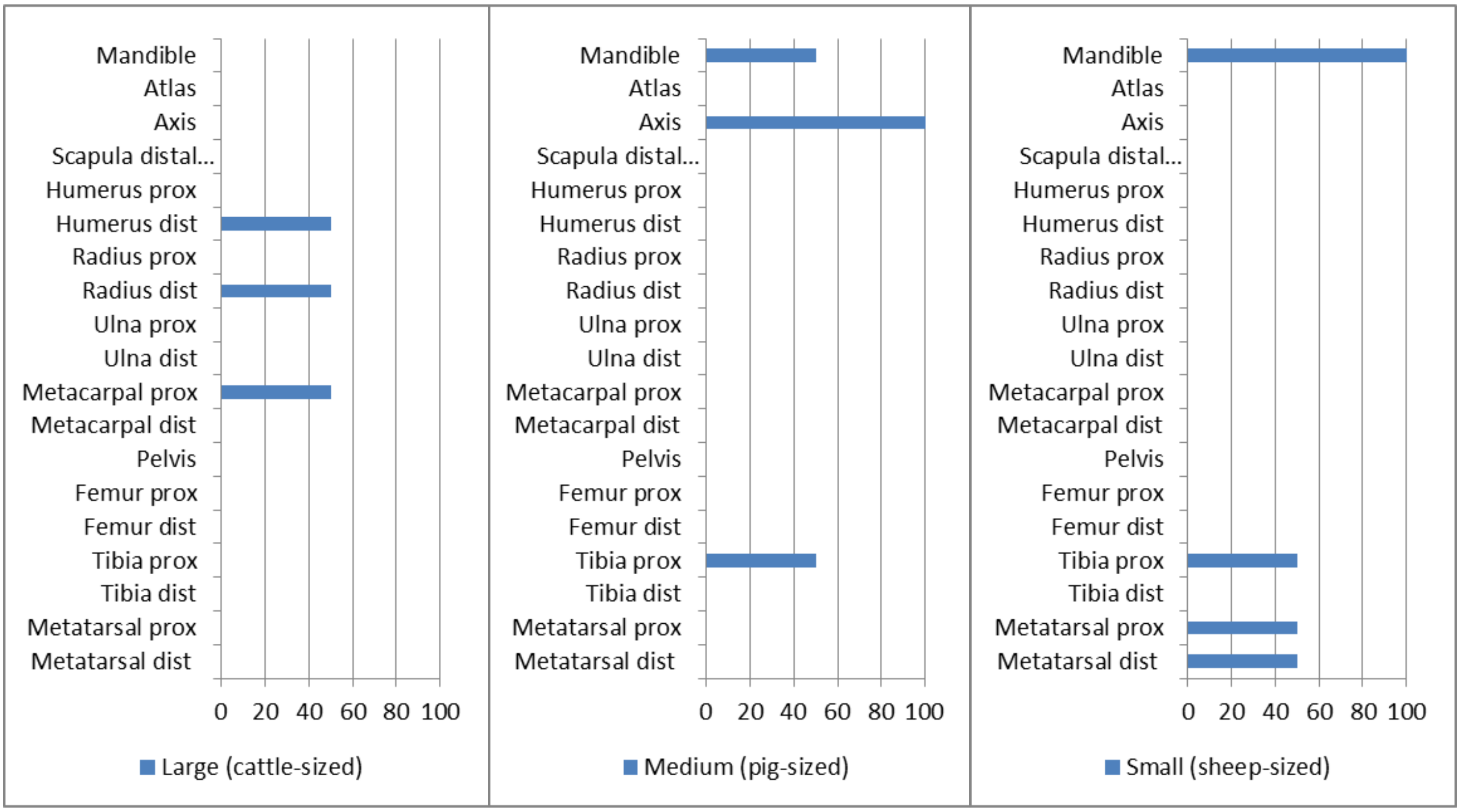

Figure 6.10. Feature 42

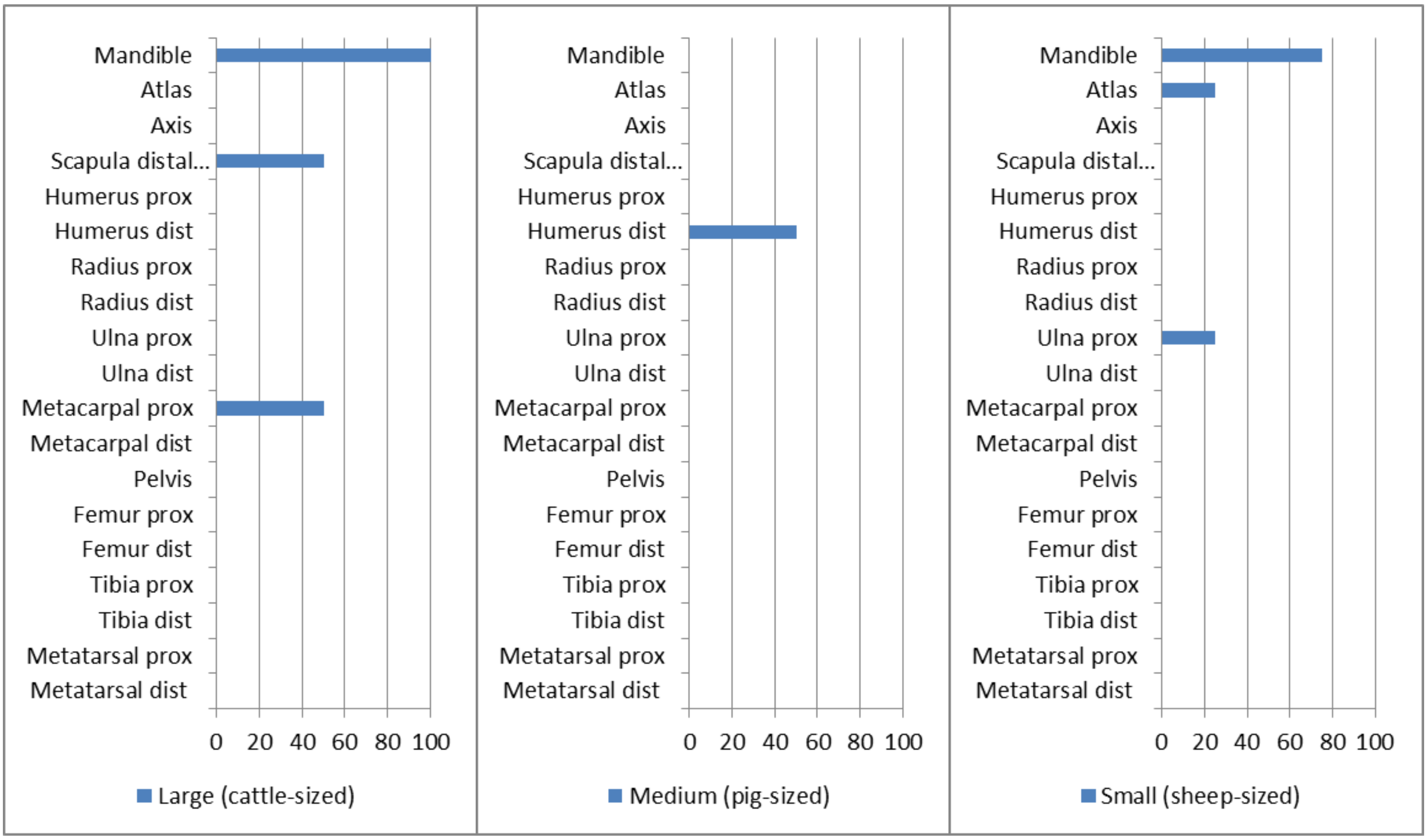

Figure 6.11. Feature 53

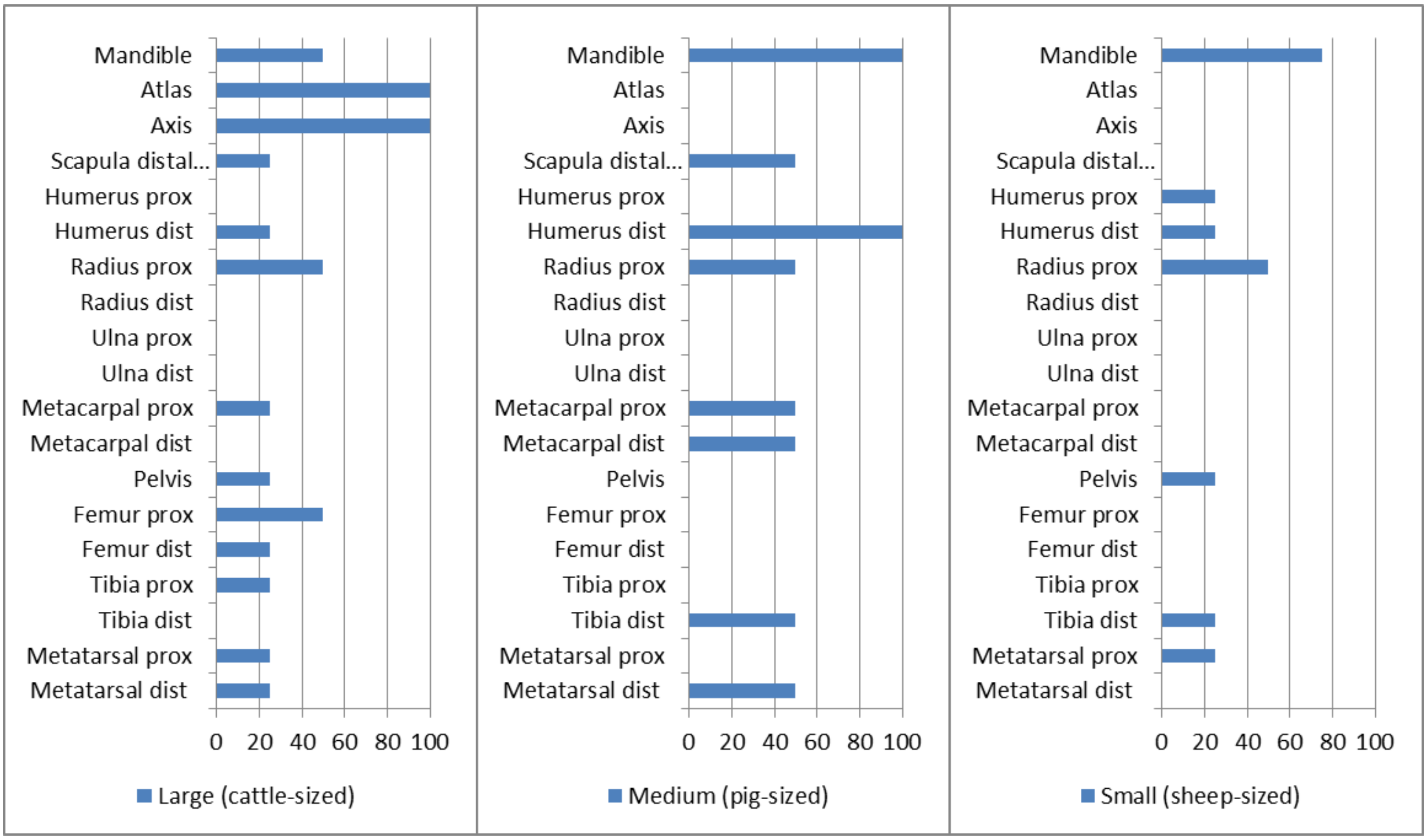

Figure 6.12. Feature 54

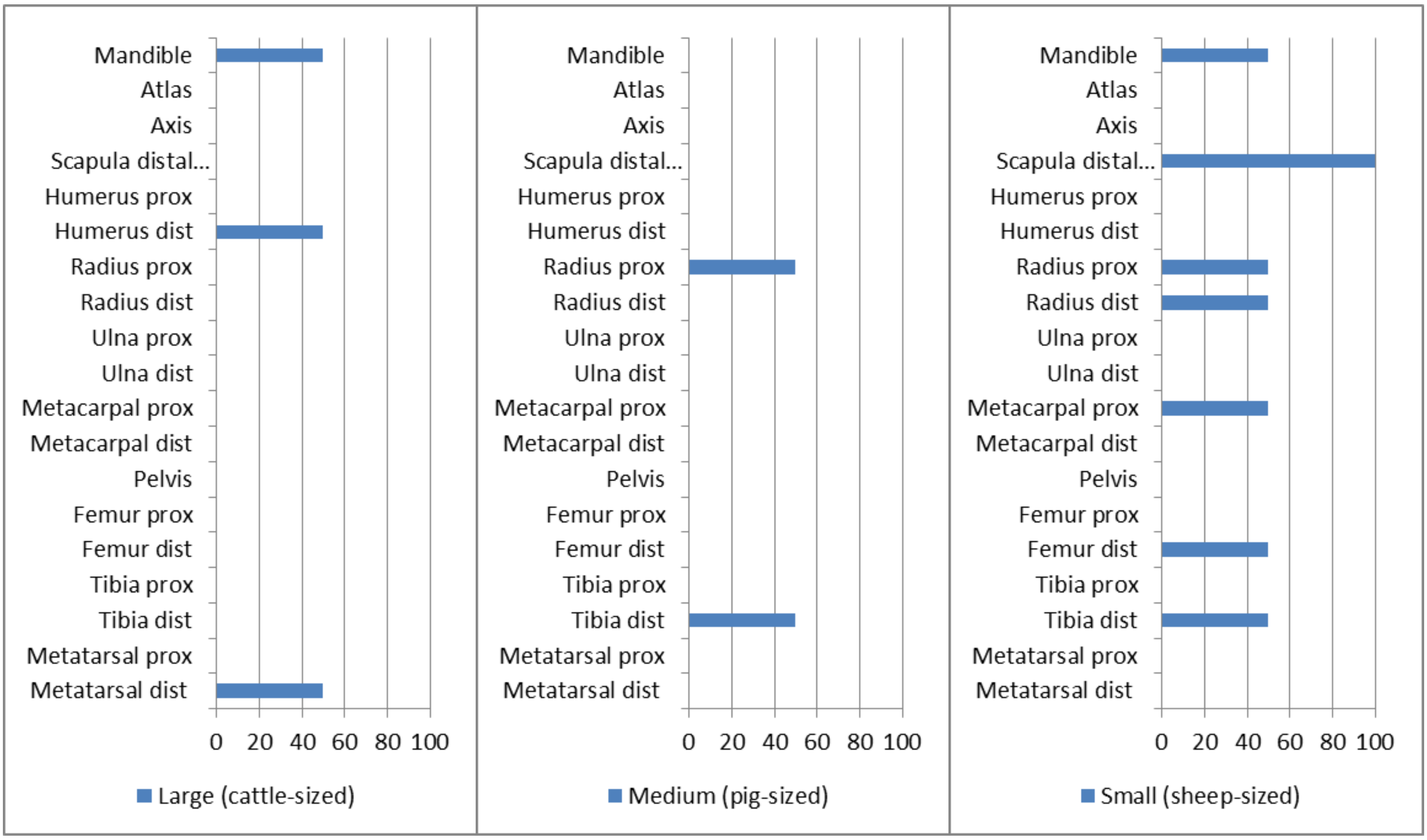

Figure 6.13 Feature 57

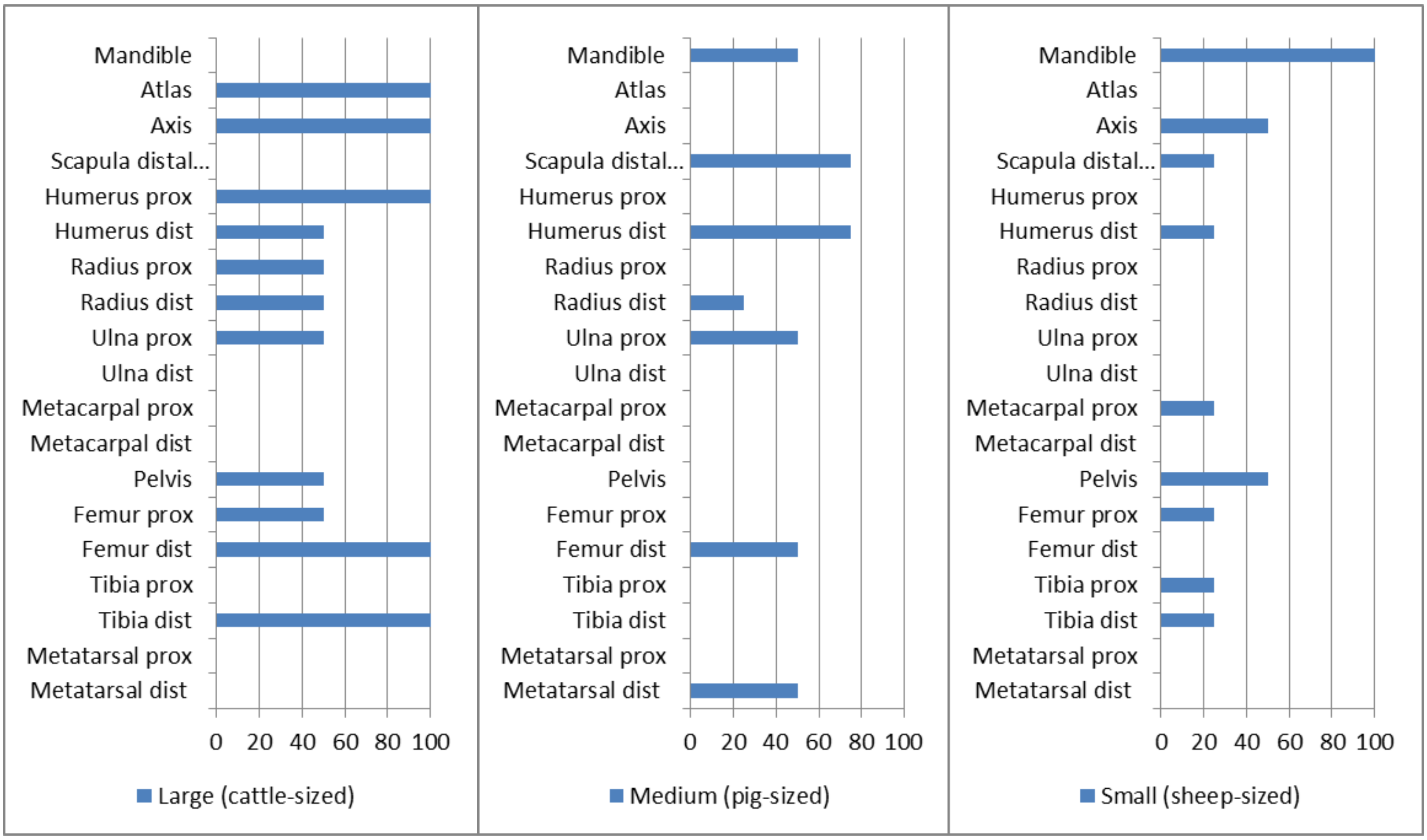

Figure 6.14. Feature 60

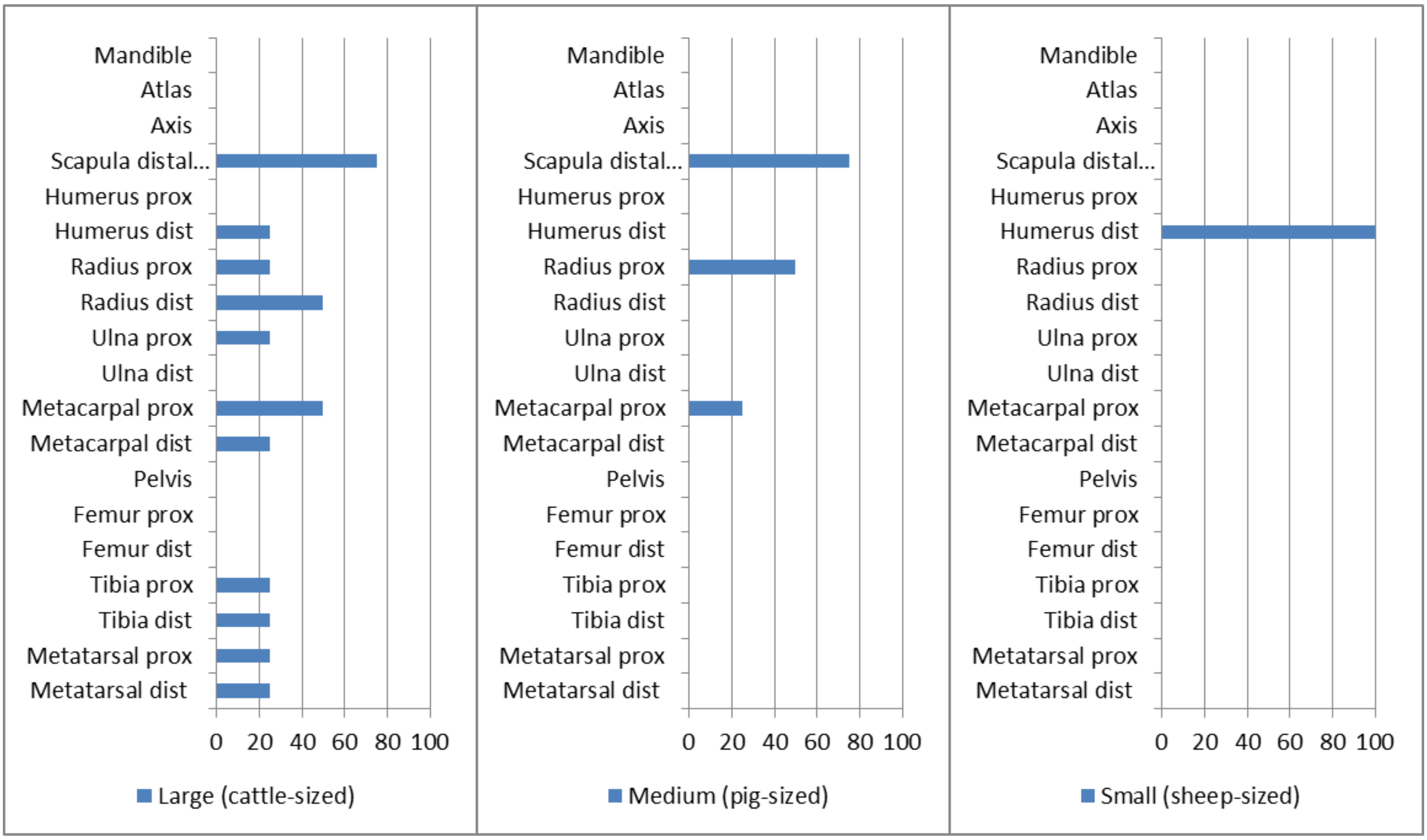

Figure 6.15. Feature 62

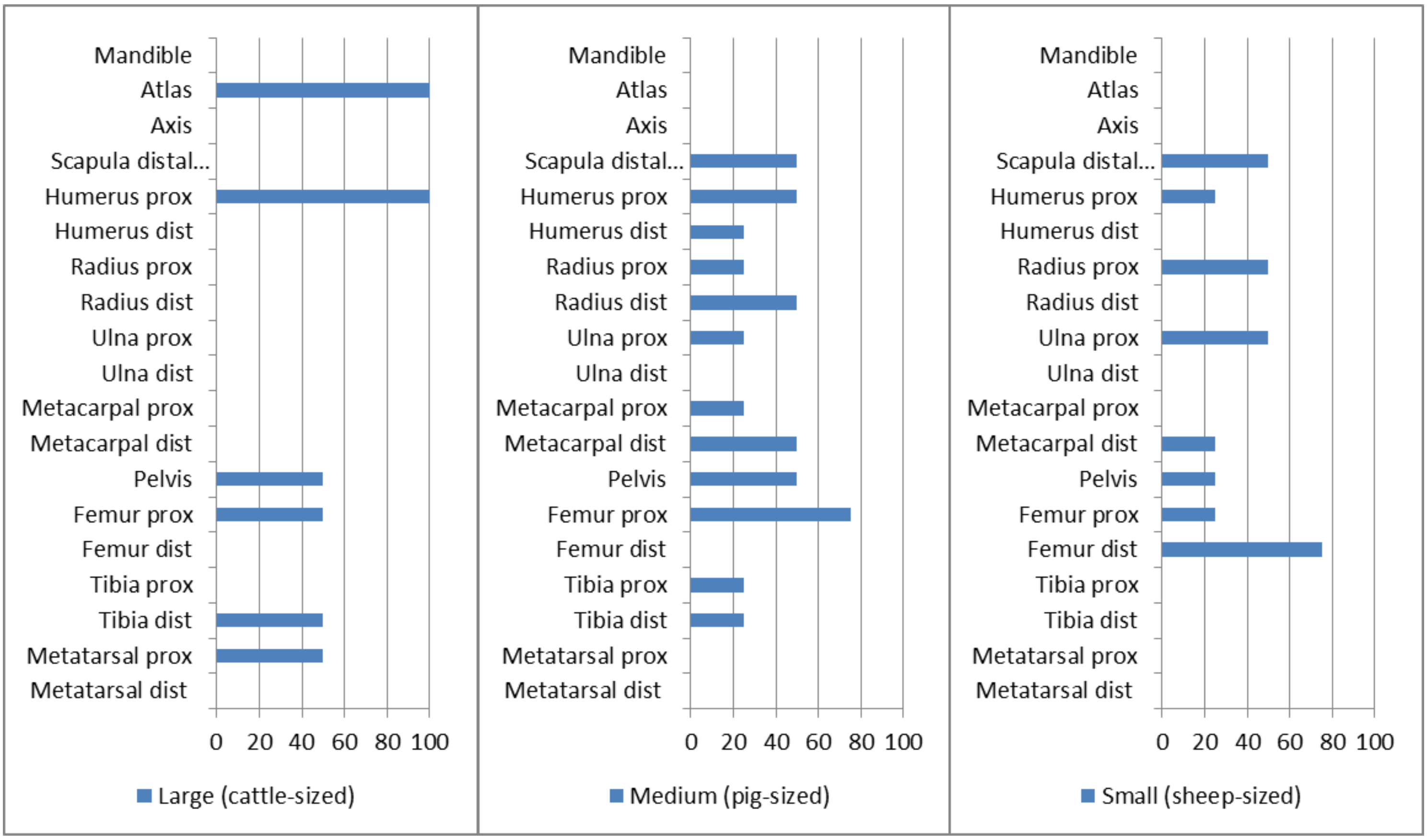

Figure 6.16. Feature 65

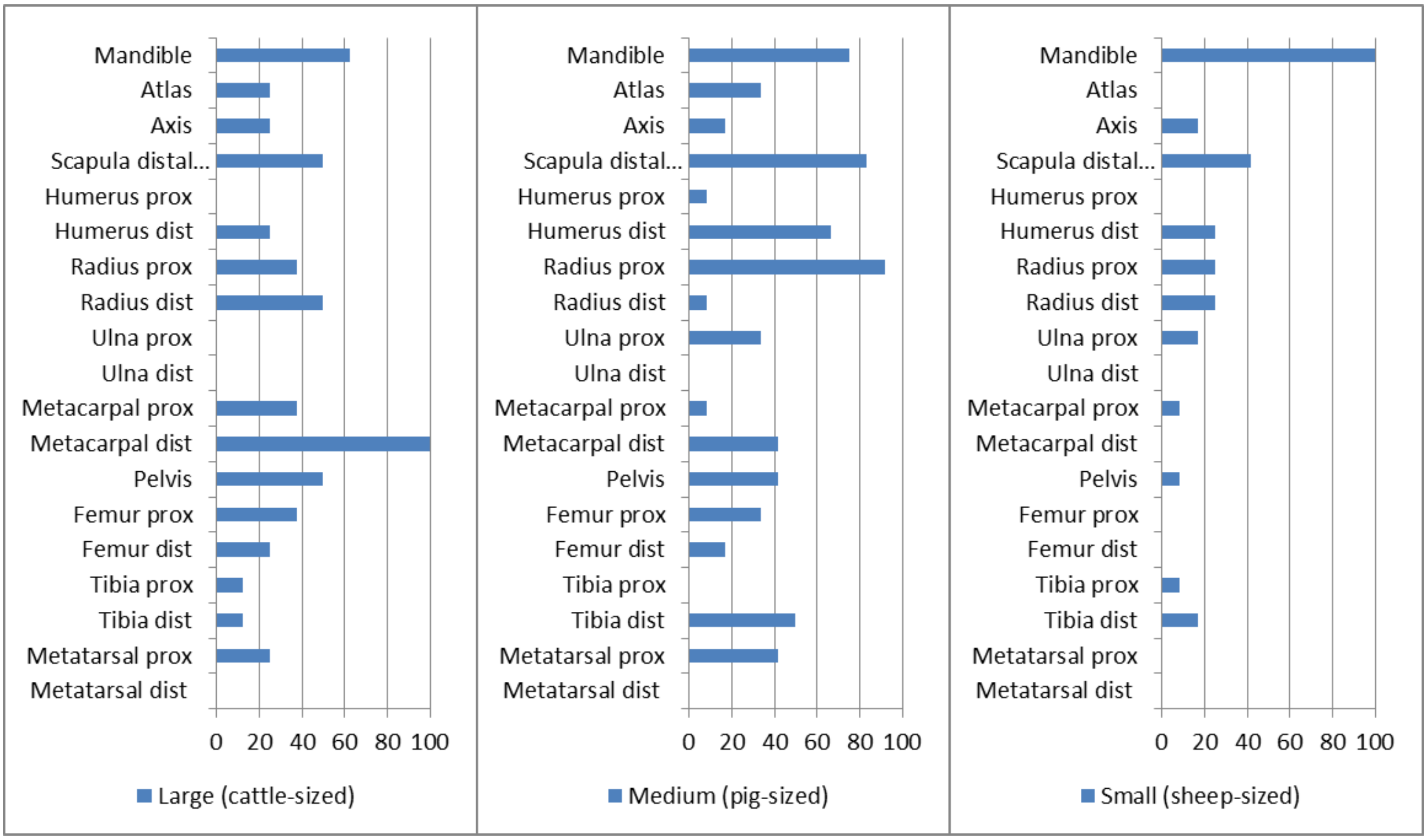

Figure 6.17. Feature 66

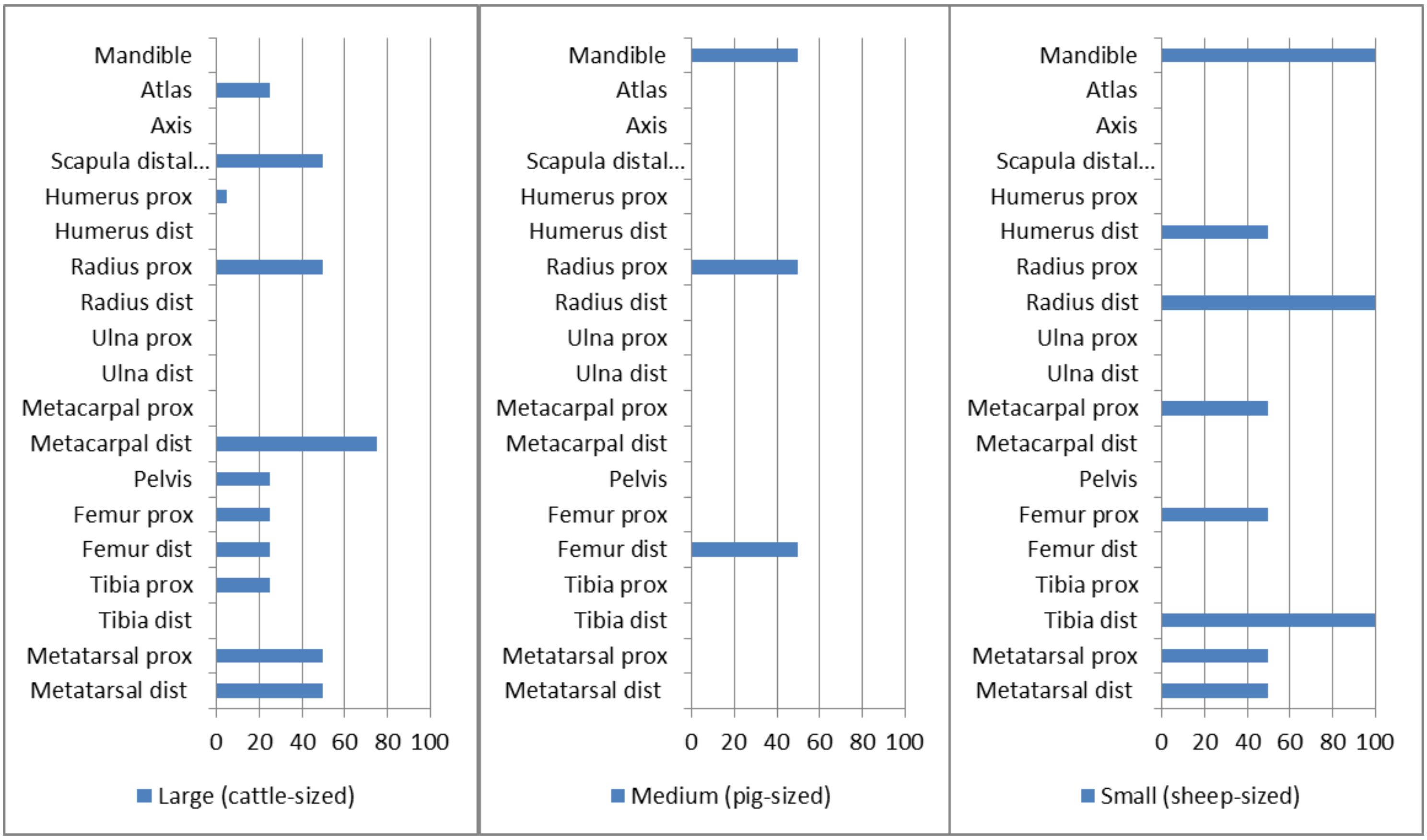

Figure 6.18. Feature 71

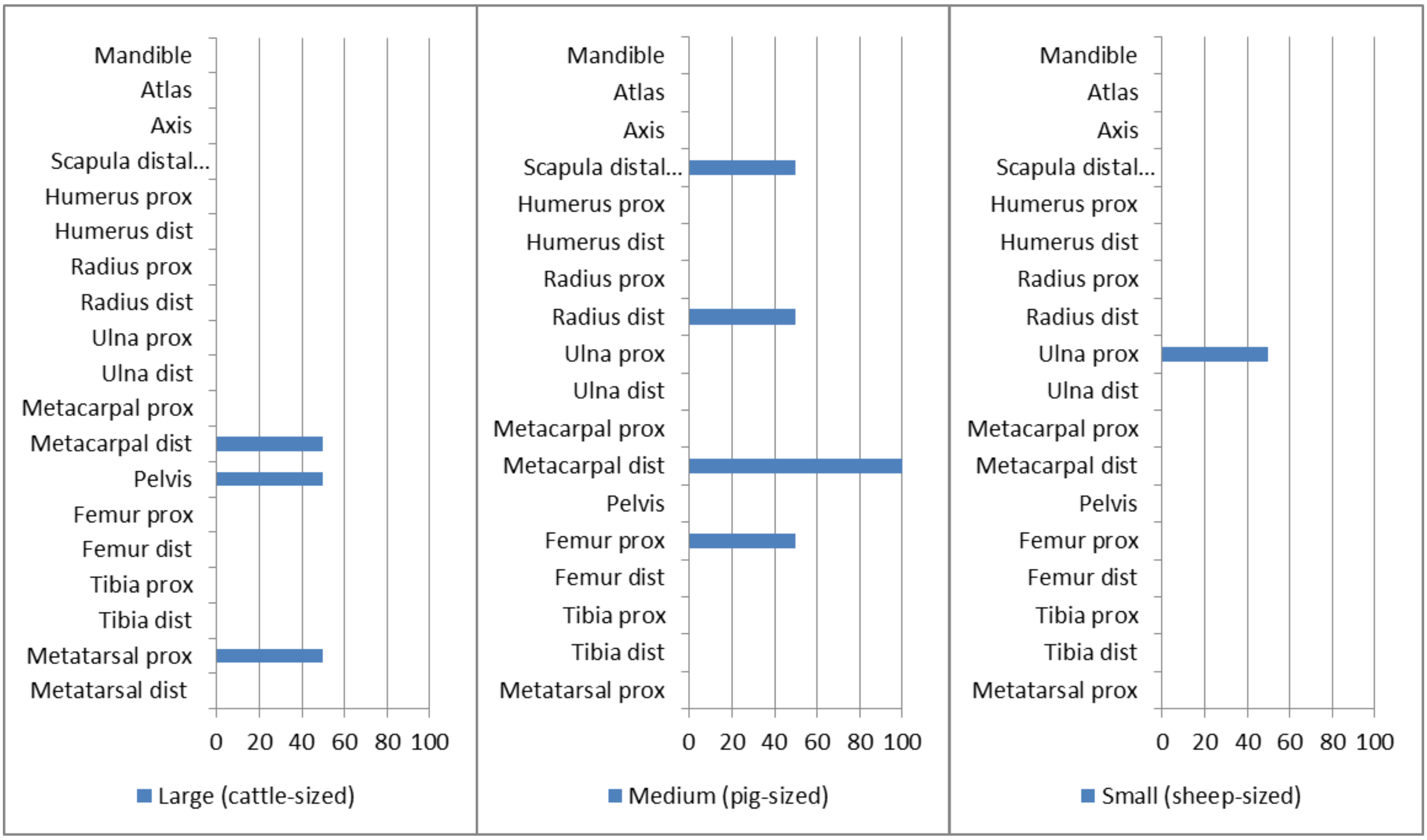

Figure 6.19. Feature 72B

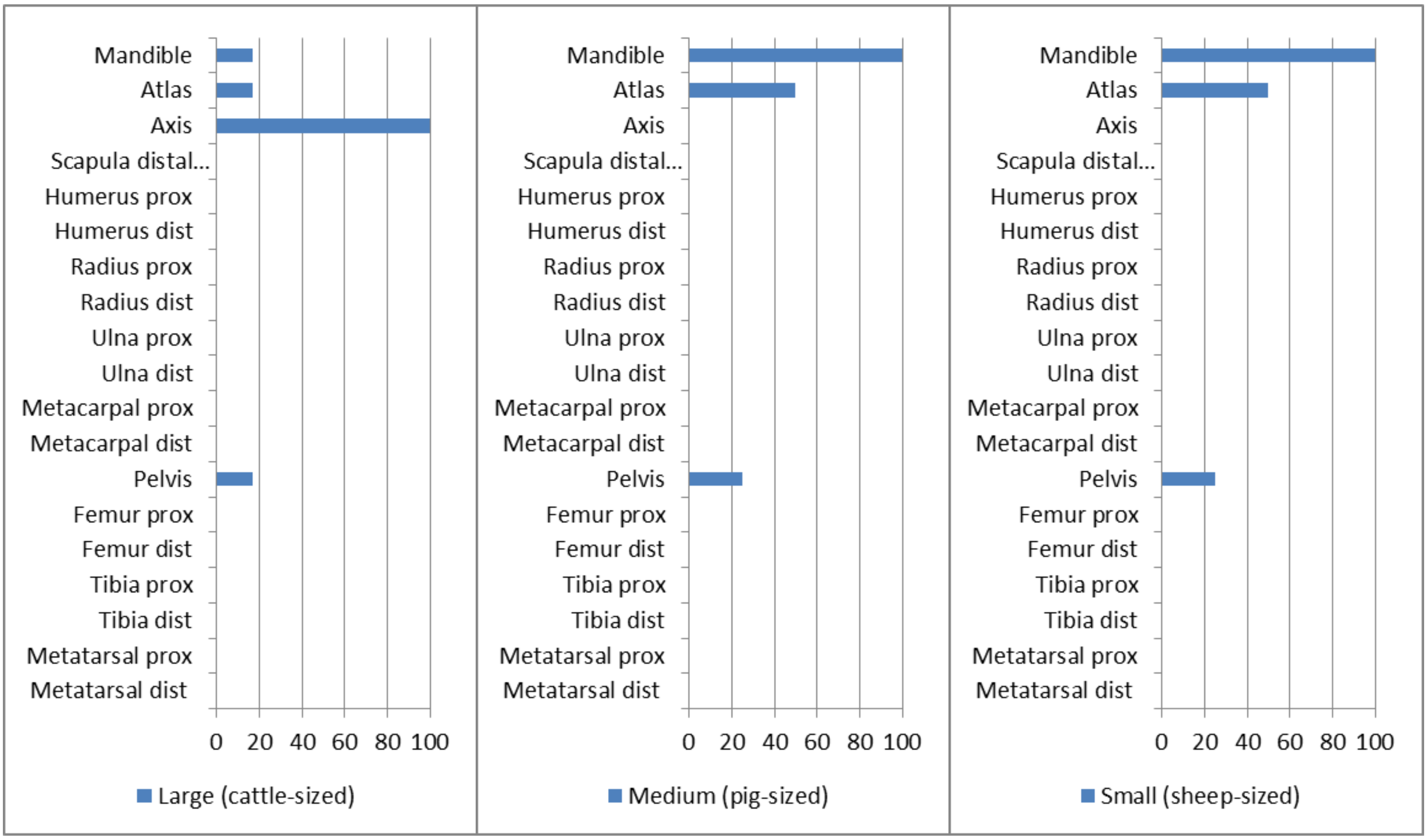

Figure 6.20. Feature 72 (total)

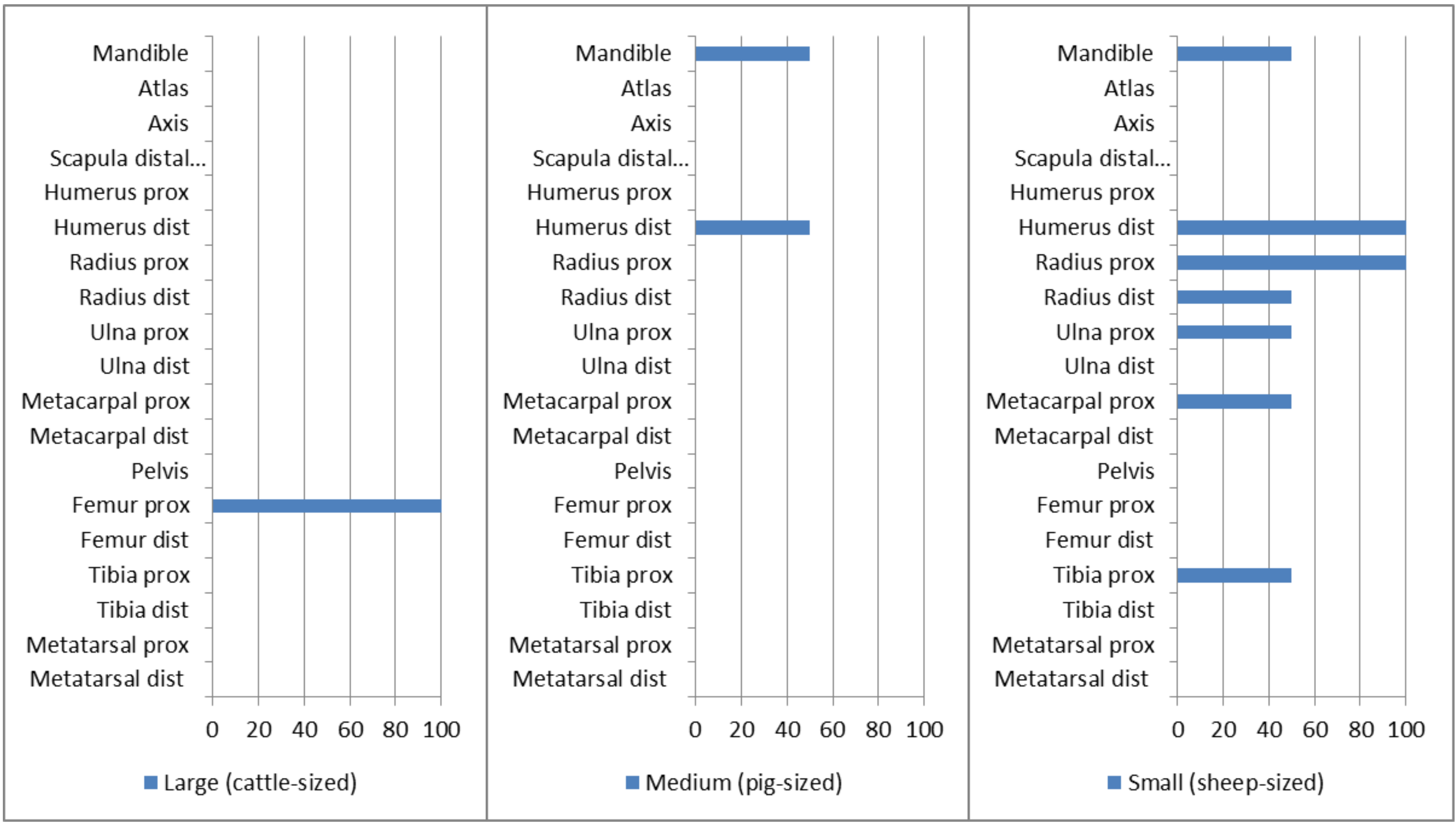

Figure 6.21. Feature 73B

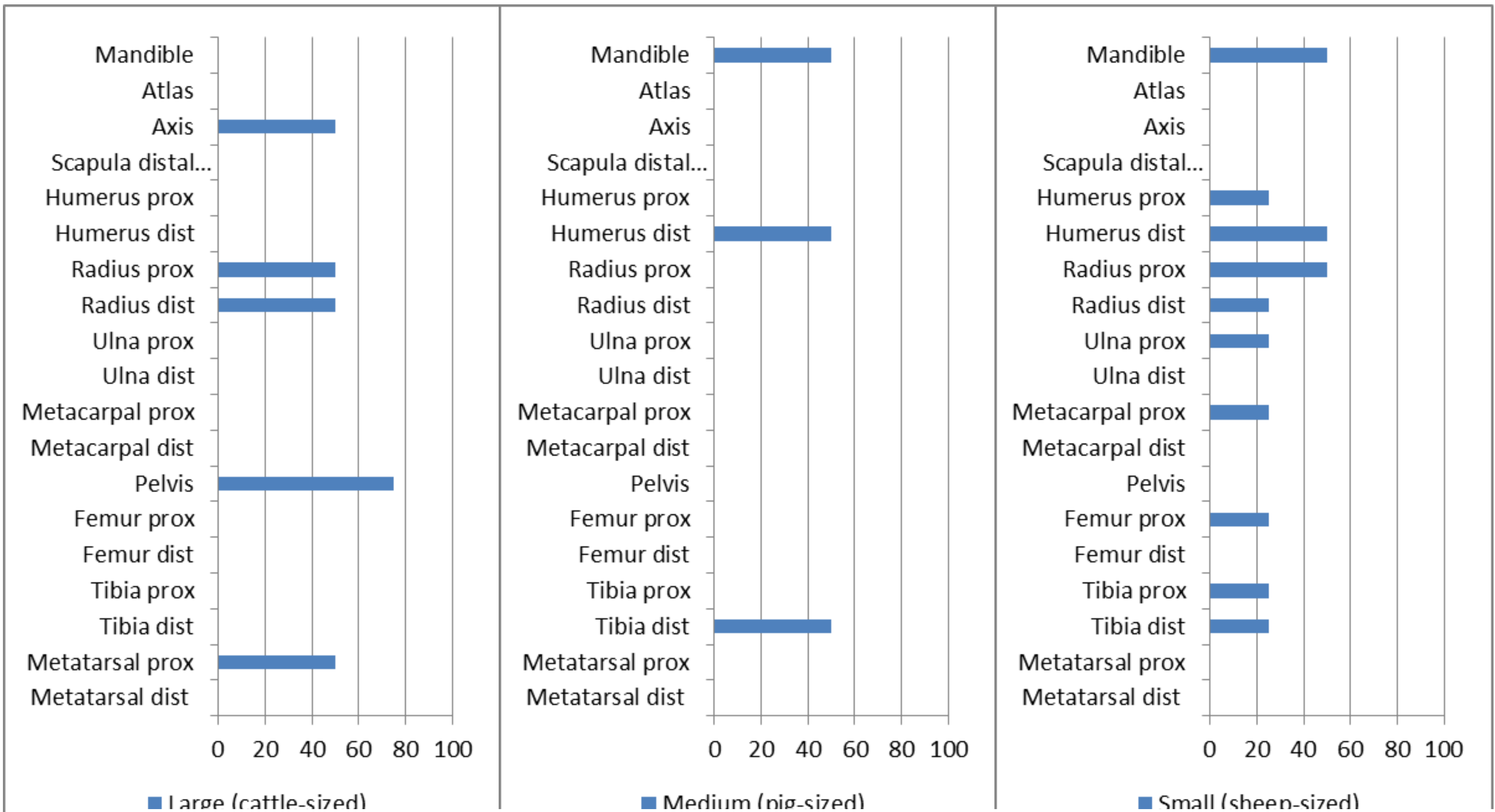

Figure 6.22. Feature 73 (totals)

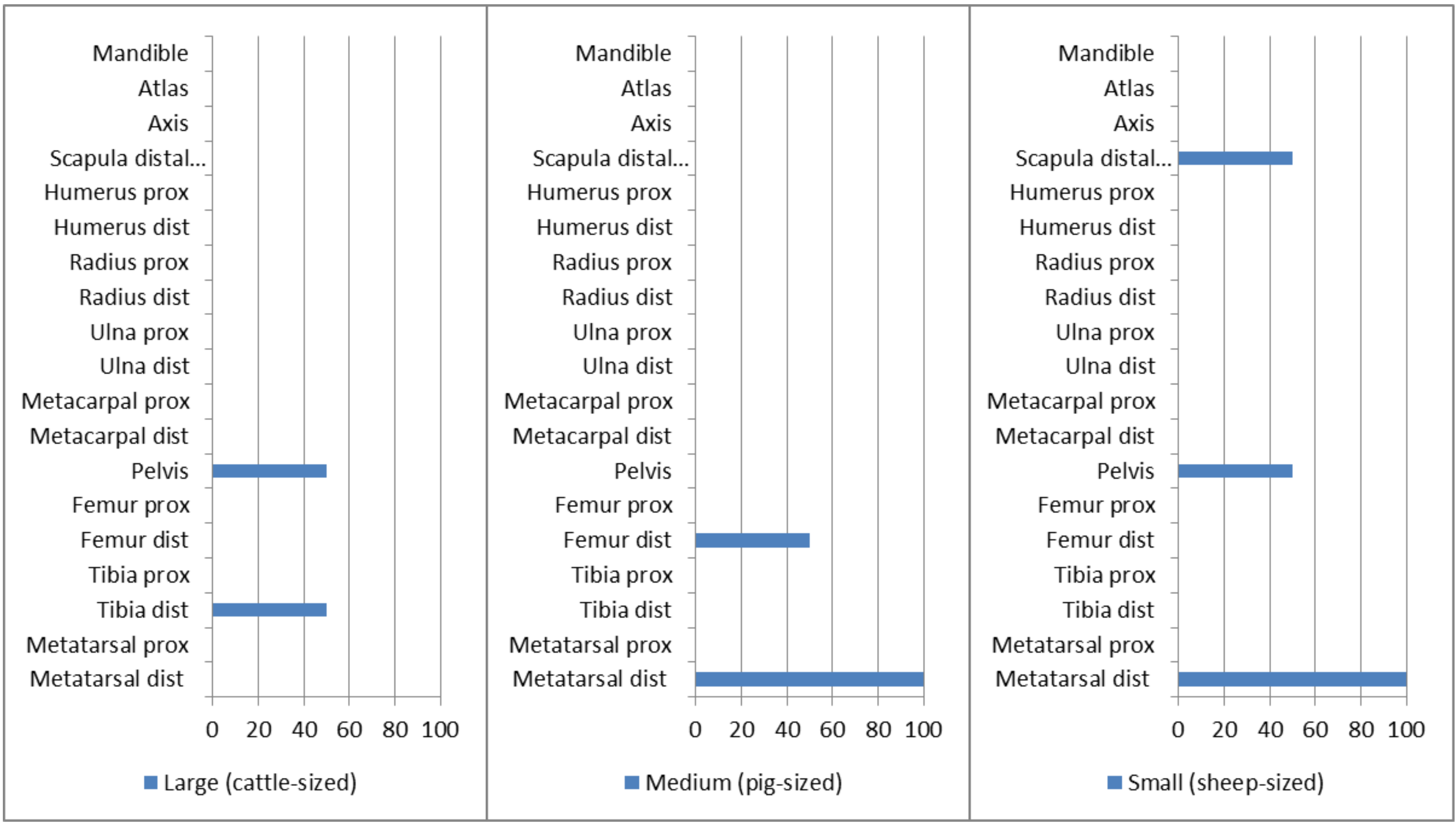

Figure 6.23. Feature 81

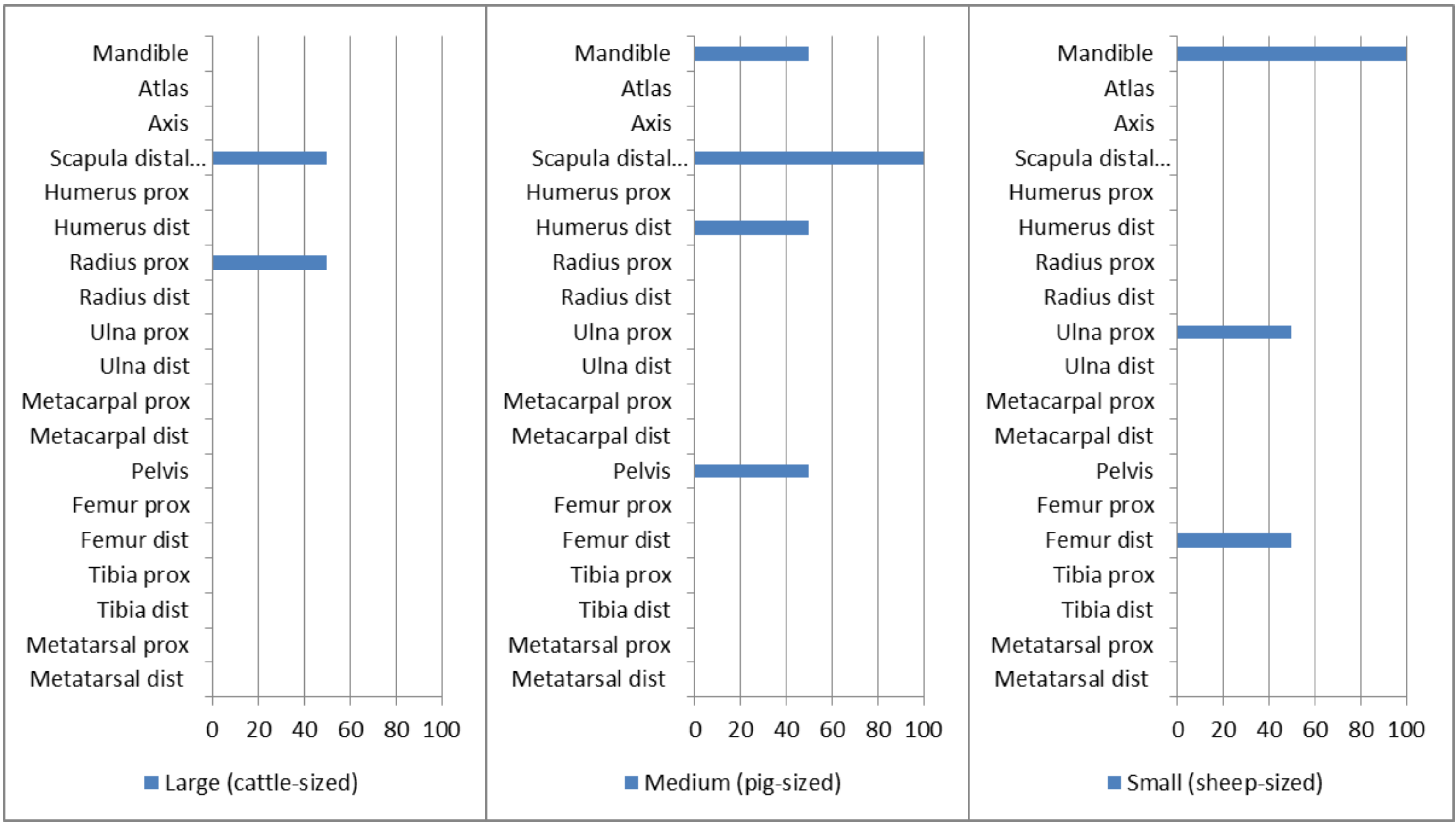

Figure 6.24.: Feature 82

As mentioned in section 3, no significant number of articulated specimens were recorded that might give the impression that large joints were being roasted, consumed, and then deposited together. The majority of the records in the database which record articulations are fragments of the same element—the result, again, of the high degree of fragmentation. Articulated remains and the presence of minimally processed bones are oftentimes faunal indicators of feasting (Twiss 2008: 422). However, as I have argued earlier, if consumption of the meat of valuable domestic and rare wild animals was an event that marked feasts as something "special", and non-quotidian, one might expect the bones to be heavily processed, to extract every bit of succulent marrow and bone grease. This is not to argue that roasting large joints did not take place at the site; the burning analysis in section 5 seems to suggest roasting was practiced. The feast goers simply processed the bones after they consumed the meat.

6.5 Discussion

Despite the setbacks of low sample size and uncertainty about the contemporaneity of the features at Sarnevo, a few things seem clear.

Meat from wild and domestic, large, medium and small animals was widely available for the users of each pit. There is no evidence for the hoarding of certain elements or of certain species. The only exceptions are Feature 73B, and Feature 21, where smaller bodied species were much more abundant than any others. At this point I would suggest that these smaller features are probably very different in their function and meaning than the larger, more complex features and the faunal material from the remainder of them needs to be examined.

If feasting in the late Neolithic placed emphasis on hospitality and generosity, with an eye towards accumulating prestige or establishing reciprocal relationships, meat sharing would be common. Therefore, we would expect to see a relatively even distribution of body parts in a collection of features that are the result of large-scale communal feasting. The opposite would be expected if feasting was more of an exclusionary practice, as is often the case among more hierarchical societies (Dielter 1996, 2001). Certain taxa or body parts would be restricted to an excluded segment of society, with a visible patterning in the faunal remains.

Though there is a lack of strong patterning, we can see that larger bodied taxa made up the majority of the remains at Sarnevo, seen in the abundance of cattle and fallow deer[9] but also in the large amount of large-bodied scrap fragments. The importance of large-bodied taxa in feasting has been well recognized by archaeologists and ethnographers. the Neolithic Levant, cattle were used almost exclusively as a feasting food, whereas their smaller bodied relatives were consumed primarily in household contexts (Twiss 2003, 2007). The mithan, small-bodied domestic cattle, is raised for and consumed at feasts in parts of India (Simoons 1968). It appears that large-bodied taxa also had an importance in feasting in the Late Neolithic of Bulgarian Thrace, although not exclusively. Their high value would have meant a considerable loss for their owner (in the case of domesticates) and therefore a greater possibility for gaining status through sharing them out.

The spatial arrangement of the pits mentioned at the beginning of the section (the two N-S rows) seemed at the outset to be a promising source of differences in patterned deposition. Upon examination, however, there seems also to be no real differences between pits on the left side or on the right side, and since it was impossible to match elements from individual carcasses, it was not possible to investigate relationships between any pits. This may change with the completion of the pair matching analysis mentioned earlier. The smaller pits in the center, those Karastoyanova labeled type 3, seem tentatively to differ in species or body part

[9] Although fallow deer were always included in the "medium" (pig-sized) category during analysis, in this instance they may be considered "large" in that they would have provided an amount of meat that would have required consumption beyond the household (c.f. Halstead 2007).

composition, beyond the fact that they generally contained fewer animal remains. Thus, it is difficult from the faunal evidence alone to say anything about the functions of the first two types of pits, yet there may be grounds for considering the third type to be functionally very different: perhaps not related to feasting at all.

It's difficult overall to speak of 'competing households' or some sort of centralized control over the distribution of meat during communal events. The involvement of the community in the feasting at Sarnevo seems clear if only because of the sheer amount of meat that was consumed and then deposited rapidly. A more equitable distribution of species and body parts might suggest a broadly equal sharing relationship among different groups, however we choose to define them.

Of course, as mentioned in section 3, communal feasting (of the type Dietler would refer to as empowering) involves a great deal of competitive sharing. The species and body part distribution observed among the features at Sarnevo could indeed reflect a competitive behavior, as people brought forth whatever animal resources they could (hunted or herded) in order to provide for the feast.

At this point, it seems there are two avenues of fruitful research if we want to understand the dynamics of Late Neolithic feasting. First would be the analysis of a greater number of pit features.. It would be especially interesting to look at the remainder of the smaller, type 3 features that are more spread out over the site. With more samples it may be possible to say something meaningful about how they differ from the two types of larger features.

Second, the data collected and discussed here *must* be compared to faunal data from everyday, non feasting contexts, which will most likely be found on settlements. Since feasting and everyday consumption exist in a dialectical relationship (Twiss 2007), feasts must be something that are markedly different from everyday consumption. This requires the fauna from settlements to be analyzed in a contextual way, to understand the spatial relationships between households and faunal remains. This remains an area for further development in some parts of the Balkans, including Bulgaria, where animal bones are often grouped together and analyzed by chronological phase rather than across different contexts.

7. Conclusions

I originally set out with two goals regarding the faunal material at Sarnevo. The first was to evaluate how probable it was that the animal remains were the result of feasting activities. The second, if the first could be argued, was to identify any characteristics in species composition, body part distribution, or patterns of deposition between the pits that might yield information about the nature of commensal consumption during the Late Neolithic.

This was done with an eye towards providing some much needed insight into the ways that animals are part of commensal politics in the Late Neolithic. In section 2 it was argued that our knowledge of Late Neolithic society was incomplete and that attempts to fill it in usually revolve around trying to understand how the need for communal cooperation articulated with the ever growing possibilities for accumulation, incorporation, and exclusion.

No doubt both dynamics were a part of Late Neolithic life in Bulgarian Thrace. The material evidence shows that population increase and the intensification of agricultural practices, livestock breeding, and landscape use meant that an increasing number of activities required organization beyond the household level. At the same time, the evidence also shows that people used their built environment in ways that enacted relationships of exclusion (e.g. more restricted access both within house and village plans) and incorporation. In addition, the increasing stability of livestock breeding and agricultural products provided opportunites for certain households to acquire status, and for others to fall into what Bogucki (2011) calls "poverty traps". Late Neolithic society was thus a dialogue between these two seemingly opposite ideas.

Section 3 argued that commensal hospitality was crucial to creating, maintaining, and negotiating these relationships. This is apparent both from the ethnographic evidence compiled over the last few decades and the increasing awareness among archaeologists that there is ample evidence for feasting in the archaeological record. Sharing and consuming animal meat during communal events during the Late Neolithic provided a means to express relationships of cooperation, especially those between households that shared the responsibility of herding, planting, or hunting. Yet they also created reciprocal obligations that served to enhance the wealth or status of those individuals or households that could afford to sacrifice surplus animal wealth at the expense of those who couldn't. Finally, feasts were most likely highly performative and memorable events, bringing people together and providing a welcome respite from the everyday work of a mixed-farming lifestyle.

In addressing the first of these two goals, I believe that the evidence does indeed lead to a feasting interpretation. Though not all the usual faunal correlates for feasting are present at Sarnevo, it matters little because there is no definitive feasting profile for animal remains and therefore no "checklist" that requires satisfaction to identify feasting. At the very least, two important correlates are present:

1. The abundance of large-bodied species, such as aurochs, domestic cattle, red and fallow deer suggest communal consumption. They are too large to be consumed at a smaller scale and there is no good evidence for storage or preservation during this period. Hunting the larger wild species, like aurochs and red deer, suggests organization beyond the household, and therefore more than one household was probably involved in their distribution and consumption. Small-bodied species are present, but are rarely more abundant in the pits than larger taxa.

2. Among the larger species, there is a higher number of "meaty" body parts. This is especially true for domestic cattle and fallow deer, but it is also somewhat true of pigs. Deer carcasses, for example, were brought back to the site nearly complete. The single-

episode deposits of animal bone at Sarnevo represent what used to be large amounts of meat—a nearly universal currency for feasts.

Several faunal correlates for feasting are absent. First, there are no large, intact portions of bones or partially articulated skeletons indicative of a wasteful treatment of a carcass and therefore ostentatious displays of one's ability to destroy wealth. This lack of wasteful treatment of carcasses does not necessarily take away from a feasting interpretation, as I have argued, following others (Hamilakis and Harris 2012), that bone marrow may have been a highly prized commodity; a rare treat for mixed farmers who may have consumed meat rarely or only in the context of feasting.

Second, since not much of the assemblage showed evidence of cooking, it was difficult to evaluate special cooking practices like roasting, which is sometimes considered a hallmark of cooking for feasts. There were a few definitive cases of roasting on the ends of joints, and more than a few on mandible fragments where the marrow was toasted and then extracted. But while roasting meat can be a special way of preparing food during feasts, as is it was in later periods, where elite status was displayed through one's ownership of special roasting spits, there is no reason to believe that this was the case for the Late Neolithic.

In fact some of the best evidence for feasting comes not from the faunal remains but from other sources. First is the unique location of Sarnevo. Though it is near to a number of settlements, it is deliberately located away from them, yet clearly has associations with them in the burnt debris that is used to cap the deposits. As mentioned earlier, capping pits with burnt daub (usually from houses) is common in the Neolithic and can take place in settlements as well. However, the fact that people carried housing debris off site and filled the pits with copious amounts of animal bone, *deliberately* broken ceramics, and other items suggests a real preoccupation with keeping these things separate from daily life. According to ethnographic case studies, feasts are sometimes held away from settlements in order to contain or dissipate their residual power, and also to deal with the large amounts of smelly, pest attracting trash.

Another good line of evidence for feasting at Sarnevo comes from the preparation of the pits themselves. While there seem to be several different types of pits, the largest, like Features 9, 34, and 28, originally had working surfaces with *in situ* grinding stones broken and left on these surfaces. They were later filled in with animal bones, broken ceramics, and the back dirt from their excavation. Since they do not appear to be pit-houses, a good explanation is that they are special preparation areas for feasts—another often cited correlate for feasting.

If they were constructed as feast preparation areas, this would be an important distinction because at this time it is not possible to completely rule out the that the faunal remains and ceramics were carried off site along with the housing debris. Even if that were the case, communal consumption would still be a possible explanation for their presence in the first place, but the only way to know for sure is to conduct thorough, context-focused investigations on the numerous settlements in the area.

Finally, the burnt daub which caps the pits suggests that they have some connection with a life-cycle event such as the deliberate destruction of a house or the death of a household (or both: both are attested during the Balkan Neolithic; see section 6). Such events are almost always accompanied by ritual consumption (Dielter 2001) and constitute "breaks" with the rhythm of everyday life that sets feasts apart from quotidian meals (Hamilakis 2008).

What then, can this study say about the nature of feasting at Sarnevo? In section 6 I looked for evidence of patterned deposition in the form of restricted distributions of taxa or body parts, and found none. The only tentative difference in deposition was found in the two examples of small, spherical pits, Feature 73B and Feature 21, which mostly contained the remains of small taxa. In both cases sheep/goat predominates, and in Feature 21 roe deer are also present in larger proportions than elsewhere. I feel that this is enough to warrant a claim that these pits are distinctly different in function than the larger pits, but this requires the remainder of these small pits to be studied in more detail.

While I'm not attempting to squeeze Neolithic feasting into some sort of inflexible typology, I think a few things are clear. First, commensal hospitality at Sarnevo appears to have more in common with what Dielter would call empowering feasts than it does with either diacritical or patron-client. Though competition was no doubt a part of sharing animal meat during this period, it seems that a more community oriented ethos was still very much present. No pit showed signs of hoarding of exotic or "expensive" taxa. Both wild and domestic animals are usually present in roughly equal amounts throughout, as are small, medium, and large-bodied taxa. If households were competing through commensal hospitality, it seems to have been done on a relatively even scale. If this were not the case, and one or more groups were hosting ostentatious feasts as a way of consolidating their superior social position, we might very well expect to see asymmetrical distributions of certain taxa in the pits.

Of course we can never know just what associations the individual pits had with social groups, but if we assume that different groups used different pits, then for now it seems like everyone had access to the same types of meat. Perhaps activities like hunting and herding were still largely community based and the emphasis on the accumulation of personal property is overstated for this period.

The exact nature of Late Neolithic social relations in Bulgarian Thrace awaits further study, but scholars mostly agree that there is little difference in the material culture or community organization between the Late Neolithic and Early Chalcolithic, even in some tells of Bulgarian Thrace where the evidence should presumably be better. As the Chalcolithic wears on, however, profound social changes do occur, and perhaps sites like the Durankulak and Varna cemeteries reflect the culmination of ever increasing social hierarchization prior to the Bulgarian Bronze Age, where evidence for social inequality is quite clear. The mechanisms of this social change may well have been at work as early as the Late Neolithic.

What the recent ethnographic and archaeological obsession with feasting has shown us is that commensal consumption has a very important role to play in negotiating social relationships and community politics. It has also shown us that cooperation and competition go hand in hand, and in transegalitarian societies, may be extremely hard to identify in the material record.

The faunal analysis presented here is only a stepping stone in understanding the relationships between humans and animals and humans and humans in the Late Neolithic. It should be expanded upon by examining the remainder of the pits at Sarnevo and at other pit sites, and compared to data collected from settlements. The greatest argument for feasting comes when the researcher can clearly distinguish it as an event that differed significantly from consumption in the 'everyday' (Russell 2012a: 383). With that in mind, any future study of animal remains from Neolithic and Chalcolithic sites in Bulgaria can only help add to a growing body of data and a clearer picture of social change in prehistory.

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